ORDER NO. HAD8511290C0
A6

2.157

Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Original

Compact Disc Player

SL-P100

Compact Disc Player

Color	Areas
(K) (S)	[M].....U.S.A.
(K) (S)	[MC].....Canada.
(K) (S)	[E].....Switzerland and Scandinavia.
(K) (S)	[EK].....United Kingdom.
(K) (S)	[XL].....Australia.
(K) (S)	[EG].....F.R. Germany.
(K) (S)	[EB].....Belgium.
(K) (S)	[EH].....Holland.
(K) (S)	[EF].....France.
(K) (S)	[Ei].....Italy.
(K) (S)	[XA].....Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
(K) (S)	[PA].....East PX.
(K) (S)	[PE].....European Military.
(K) (S)	[PC].....European Audio Club.

Color

(K)...Black Type
(S)...Silver Type

SPECIFICATIONS

■ Audio

No. of channels: 2 (left and right, stereo)
Frequency response: 4—20,000 Hz ±0.3 dB
Dynamic range: More than 96 dB
S/N ratio: More than 100 dB
Harmonic distortion: 0.0015% (1 kHz, 0 dB)
Total harmonic distortion: 0.003% (1 kHz, 0 dB)
Channel separation: More than 100 dB
Wow and flutter: Below measurable limit
Low-pass filter: High resolution digital filter

■ Signal Format

Sampling frequency: 44.1 kHz
Correction system: Technics Super Decoding Algorithm
D-A conversion: 16-bit linear

■ Pickup

Type: Fine-focus, one beam

FF-1

Light source: Semiconductor laser
Wavelength: 780 nm
Traverse system: High-speed linear access system
Spindle system: Brushless DD motor

■ Functions

Automatic play: All tracks.
Random access play: Track number or index number.
Repeat play: Entire disc or programmed tracks.
A-B block repeat play.
Program repeat play.
Search: Forward/backward track skip.
Forward/backward manual search.
Program play: For up to 20 steps
Index programming (max. of 10 to 19).
Display: Programmed tracks.
Current track.
Index numbers.
The following four time modes display minutes and seconds according to the time mode select button setting:
① Disc remaining playing time.
② Track number and remaining playing time of current track.
③ Disc elapsed playing time.
④ Track number and elapsed playing time from beginning of current track.
Other functions: Time display mode switching function.
Disc indicator.
Disc loading: Motor-driven horizontal type.

Technics

Matsushita Services Company
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Secaucus, New Jersey 07094

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Matsushita Electric of Canada Limited
5770 Ambler Drive, Mississauga.
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2.157

■ General

Power supply:
For U.S.A. and Canada:
AC 120V, 60Hz
For United Kingdom and Australia:
AC 240V, 50Hz
For Continental Europe:
AC 220V, 50Hz
For Others:
AC 110~127/220~240V, 50/60Hz

Power consumption: 16 W
Output voltage: 2 V (at 0 dB)
Output impedance: Approx. 600Ω
Load impedance: More than 10 kΩ
Dimensions (W×D×H): 43×26.5×7.7 cm (16-15/16"×10-7/16"×3-1/32")
When disc holder is opened
39.7 cm (15-5/8") (D)
Weight: 4.2 kg (9.3 lbs.)

Specifications are subject to change without notice for further improvement.
Weight and dimensions are approximate.

■ CONTENTS

	Page
SAFETY PRECAUTION	2
PRECAUTION OF LASER DIODE	3
BEFORE USING THIS UNIT	3
LOCATION OF CONTROLS	4
FUNCTIONS	5
HANDLING PRECAUTION FOR OPTICAL PICKUP	7
DISASSEMBLY INSTRUCTIONS	8
HOW TO REPLACE IC'S	16
TEST DISC (SZZP1014F) CONTENTS	23
TROUBLE SHOOTING	24
EXPLODED VIEWS	26
REPLACEMENT PARTS LIST	29
RESISTORS AND CAPACITORS	31
TERMINAL FUNCTION OF LSI	33
PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM	37
INTERNAL CONNECTION OF FL	37
PRINTED CIRCUIT BOARDS	39
SCHEMATIC DIAGRAM	44
BLOCK DIAGRAM	52

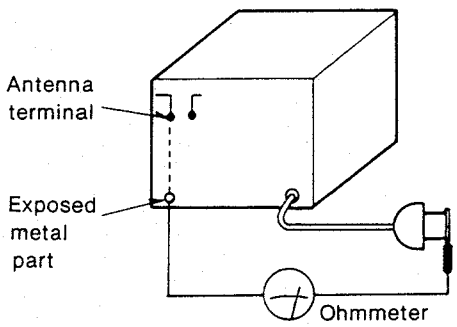
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

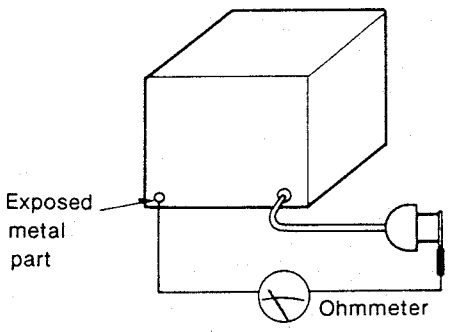
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



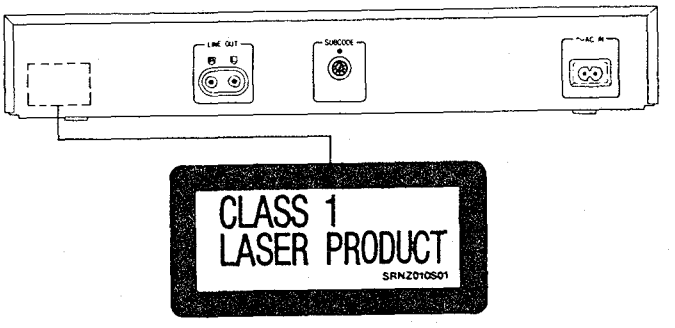
(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ PRECAUTION OF LASER DIODE

Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.



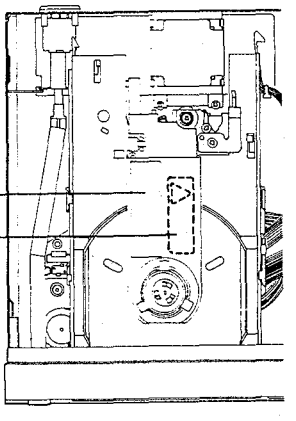
Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

- **Use of caution labels** Note: ○ Mark is used, × Mark is not used.

Areas	Disc clamper	SQWD10	SQWD11	SRNZ010S01	SRNZ010S02
[M], [XA], [XM] [EC], [PA], [PE] [PC]	○	×	×	×	×
[MC]	○	○	×	×	×
[E]	○	×	○	○	○
[EK], [XL], [EG] [EB], [EH], [EF] [Ei]	○	×	×	○	○

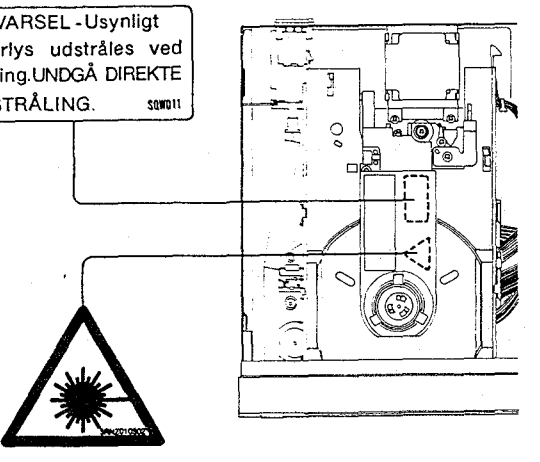
DANGER-Invisible laser
radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

Disc clamper



"CAUTION-HAZARDOUS LASER, AND ELECTROMAGNETIC RADIATION WHEN OPEN"
"ATTENTION-RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT"
SQWD10

ADVARSEL - Usynligt laserlys udstråles ved åbning. UNDGÅ DIREKTE BESTRÅLING. SQWD11

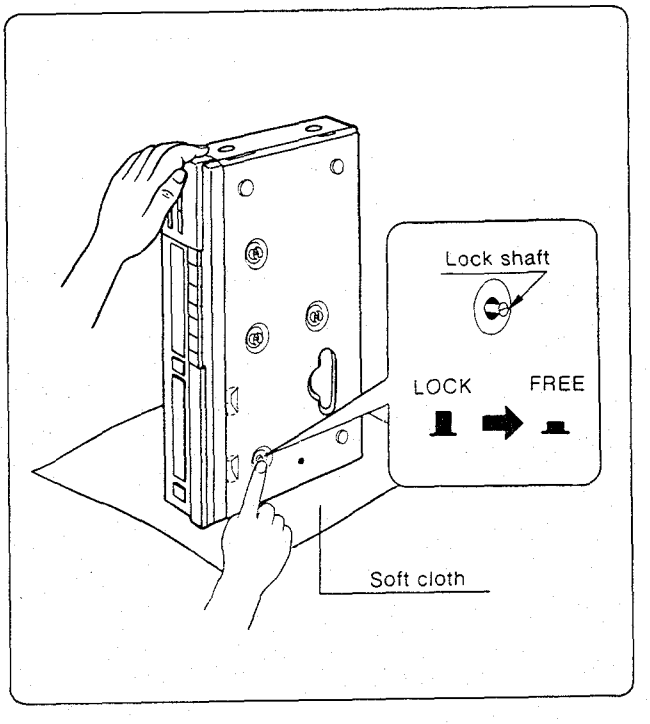


VAROITUS! Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilya

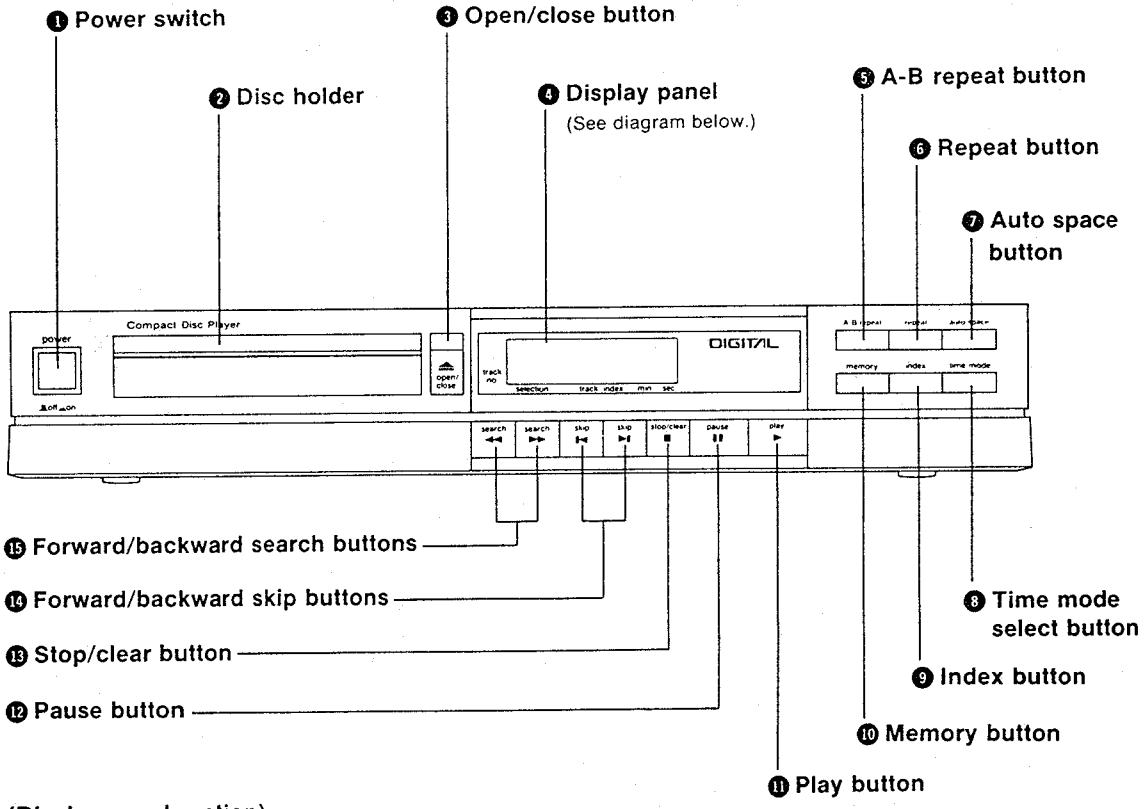
■ BEFORE USING THIS UNIT

1. Place a soft cloth under the unit to protect it from scratches.
2. Press the lock shaft on the bottom panel to the in position (▟▁▙).

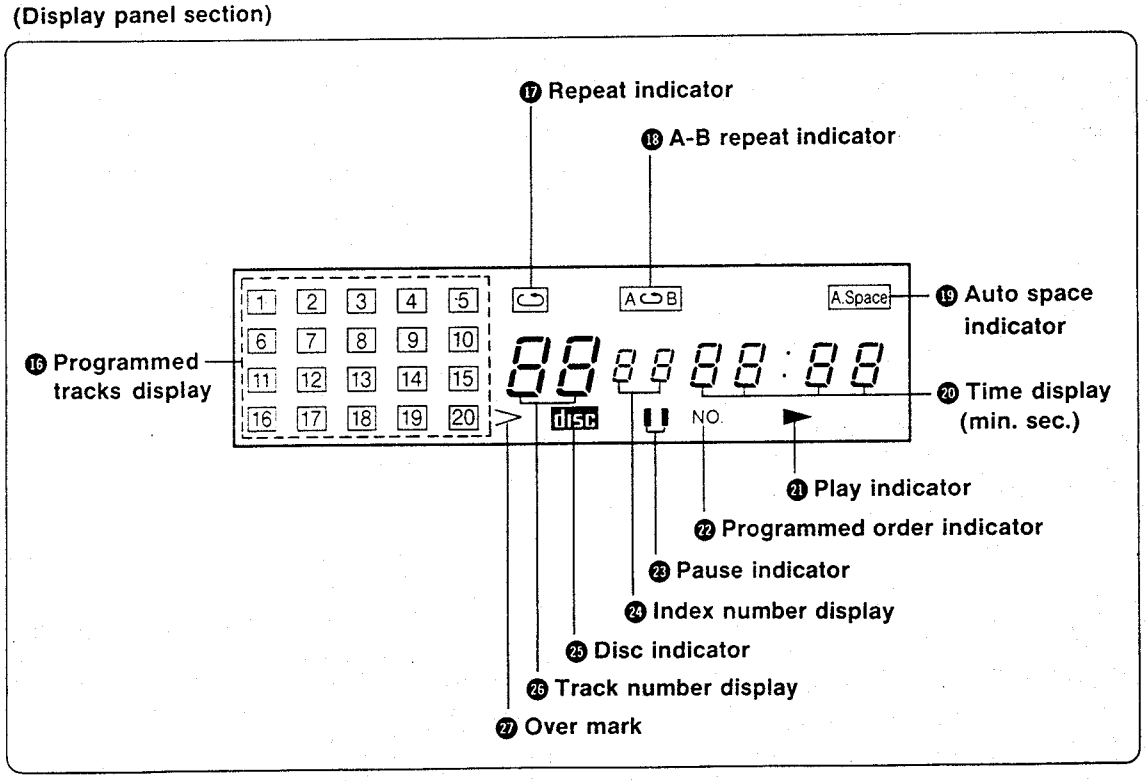
NOTE:
IF THE PLAYER IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING, STEPS:
1) Remove the disc from the holder.
2) Press the lock shaft to the out position (▙▁▟).
CAUTION:
Do not transport the player without locking the lock shaft. Severe damage will result.



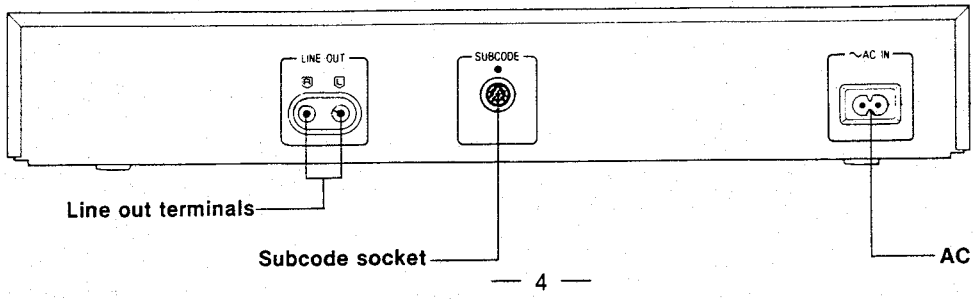
■ LOCATION OF CONTROLS



(Display panel section)



Rear panel of player



■ FUNCTIONS

❶ Power switch

Press (▙→▁) to switch power on and press again (▁→▙) to switch power off.

❷ Disc holder

The disc is inserted in this holder with the label side up.

❸ Open/close button

Press this button to open and close the disc holder.

❹ Display panel

(Please refer to items ⓲ to ㉚.)

❺ A-B repeat button

Press to repeat a section between two specified points A and B.

- The first time this button is pressed, the " A⊃ " repeat indicator illuminates, and the starting point of the disc section to be played repeatedly is set.
- The second time this button is pressed the "A⊃B" repeat indicator illuminates. The ending point of the repeat section is set.
- The section of the disc between these two points will now be played repeatedly until this button is pressed a third time to cancel the A-B repeat mode. This function is very convenient because it allows you to specify a section to be played repeatedly while listening to a disc.

❻ Repeat button

Press this button to activate the repeat mode.

❼ Auto space button

Press this button to set a silent interval of 3 seconds between the songs on a disc.

❽ Time mode select button

Use this button to select the desired time display mode.

① Disc remaining playing time.
② Track number and remaining playing time of current track.
③ Disc elapsed playing time.
④ Track number and elapsed playing time from beginning of current track.

❾ Index button

Press this button to specify an index number instead of a track number.

> **Index:**
> In some compact discs, indexes are used to divide tracks into smaller sections for easy access. If a disc includes indexes, a list of the indexes will be contained in the liner note included with that disc.

❿ Memory button

Press this button to enter track numbers, just determined by the skip buttons, into memory.

- Up to 20 memory steps are possible.
- The letter "F" will be displayed if more than 20 memory steps are attempted.

⓫ Play button

Press this button to begin disc play.

- If pressed during disc play, the pickup returns to the beginning of the first track playing the disc again.
- During program play, the pickup returns to the beginning of the current track.

(Auto-return play function)

> **Pickup:**
> The pickup is the device that reads the information on the disc surface using a laser. The pickup moves across the disc as the disc is played, but it is not visible from outside of the cabinet.

⓬ Pause button

Press this button to briefly stop disc play.
To continue disc play, press the play button.

⓭ Stop/clear button

Press this button to stop disc play.
Press this button to stop disc play and/or cancel all previous settings.
Note:
When this button is pressed, the player returns to the stop mode.

> **Stop mode:**
> In the stop mode, the pickup is at the beginning of the first track and the display shows the total number of tracks and total playing time of the disc.

⓮ Forward and backward skip buttons

Use these buttons to perform the following three operations.

1. **To start disc play from a specific track or index number (random access play).**
   Press either skip button before starting disc play.
2. **To program track numbers before starting disc play (program play).**
   Press either skip button before starting disc play.
3. **To move to the beginning of a specific track or index (skip play).**
   Press either skip button during disc play or the pause mode.

⓯ Forward and backward search buttons

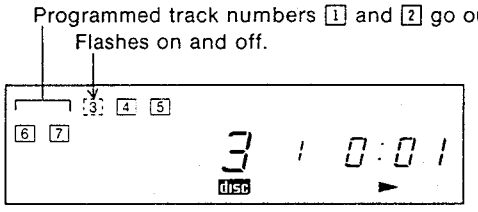
Use these buttons to move the pickup forward or backward (manual search play function).

⑯ Programmed tracks display

The programmed tracks display has the following three display modes.

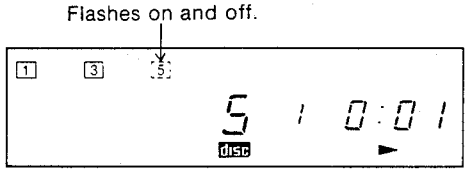
1. **When a disc is loaded, this display shows the total number of tracks.**
   For example, the diagram below shows that the disc has 7 tracks and a total playing time of 49 minutes and 58 seconds.
   Note:
   If a disc containing more than 20 tracks is loaded, the > indicator will illuminate.

2. **When play is to start from a specific track, and the track number has been specified before disc play, the track number flashes on and off during play.**
   For example, the diagram below shows that disc play is to begin from track 3.



During disc play, the track number currently being played flashes on and off.

3. **When track numbers are programmed before the start of disc play, the currently playing programmed track number flashes on and off.**
   For example, the diagram below shows that tracks 5, 3 and 1 are to be played. During disc play, the number of the track currently being played flashes on and off.



Note:
When number highter than 20 is played during disc play or program disc play it is not indicated on the programmed track display.

⑰ Repeat indicator (↻)

Illuminates when the repeat button is pressed to activate the repeat mode and goes out when the repeat mode is cancelled.

⑱ A-B repeat indicator

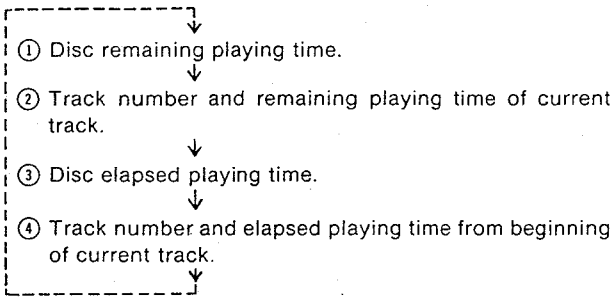
Illuminates when the A-B repeat mode is activated by pressing the A-B repeat button.

⑲ Auto space indicator (A.Space)

Illuminates when the auto space button is pressed to activate the auto space mode and goes out when the button is pressed again to cancel the auto space mode.

⑳ Time display (min., sec.)

This display shows four time modes in minutes and seconds according to the current setting of the time mode select button ⑧.


① Disc remaining playing time.
② Track number and remaining playing time of current track.
③ Disc elapsed playing time.
④ Track number and elapsed playing time from beginning of current track.

㉑ Play indicator (▶)

Illuminates when the play button is pressed and goes out when disc play is stopped.

㉒ Programmed order indicator (NO)

The programmed track numbers and corresponding program step numbers are displayed here one by one.

㉓ Pause indicator (▮▮)

Illuminates when the pause button is pressed and goes out when the pause mode is cancelled.

㉔ Index number display (index)

Index numbers up to 99 can be shown here.
On discs having no indexes, this display will always read "1".

㉕ Disc indicator (disc)

Illuminates when a disc is in the holder (if power is on) when the disc holder is closed. This indicator allows you to check in an instant whether or not a disc is loaded.

㉖ Track number display (track)

Track numbers up to 99 can be shown here.
Track numbers are displayed in a loop. Therefore, while the forward or backward skip button is depressed, the displayed track number will continue to change as follows:
(However, this is only possible when the unit is in stop mode or during repeat play.)

- When the forward skip button is pressed.
  ↻ 1→2→3→4→5→6→7 ↻
- When the backward skip button is pressed.
  ↻ 7→6→5→4→3→2→1 ↻

Note:
In the repeat play mode, it is not possible to backward skip from 1 to 7.

- This feature conveniently allows you to select the desired track using the forward or backward skip button while in the stop mode.

㉗ Over mark (>)

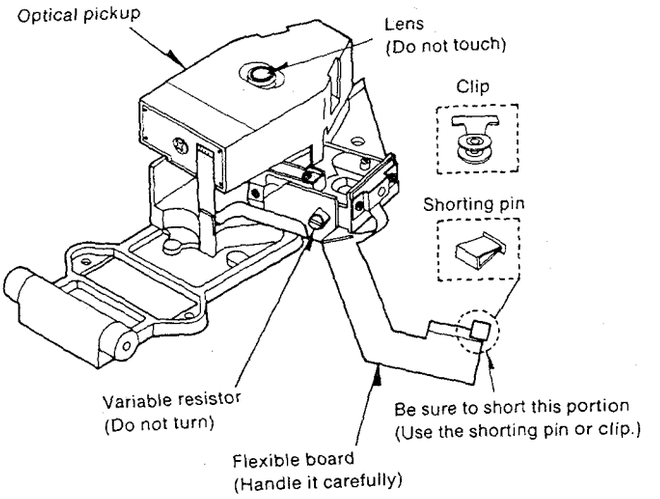
Illuminates when a disc having more than 20 tracks is loaded.

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

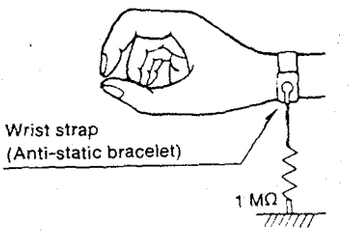
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. When removing or connecting the short pin, finish the job in as short a time as possible.
3. Take care not to apply excessive stress to the flexible board.
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

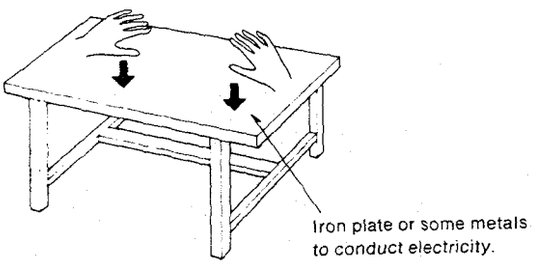


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.





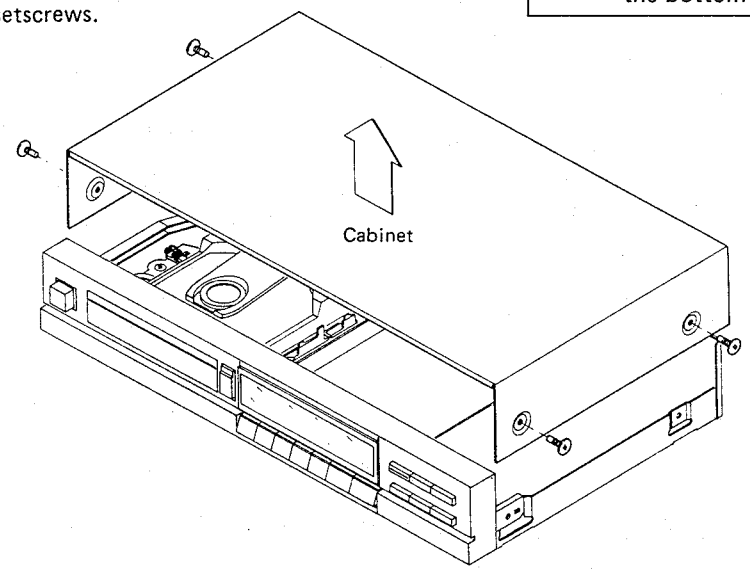
■ DISASSEMBLY INSTRUCTIONS

CAUTION:

- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

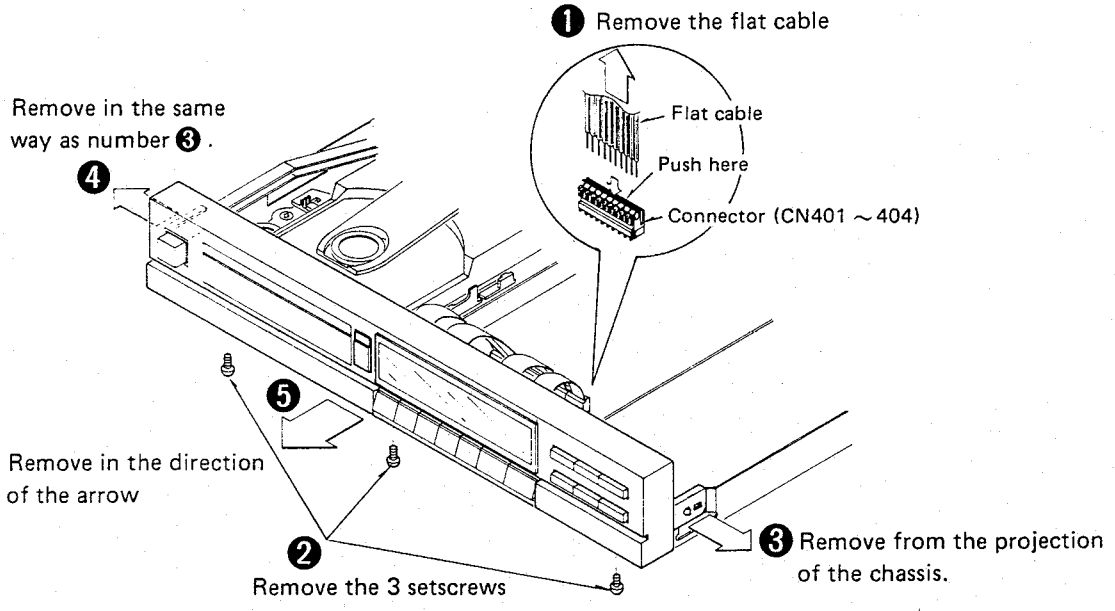
Ref. No. 1	How to remove the cabinet
Procedure 1	• Remove the 4 setscrews.

Note: Locking the lock shaft at the bottom of the unit.



Ref. No. 2	How to remove the front panel
Procedure 1 ➡ 2	• Remove in the numerical order shown.

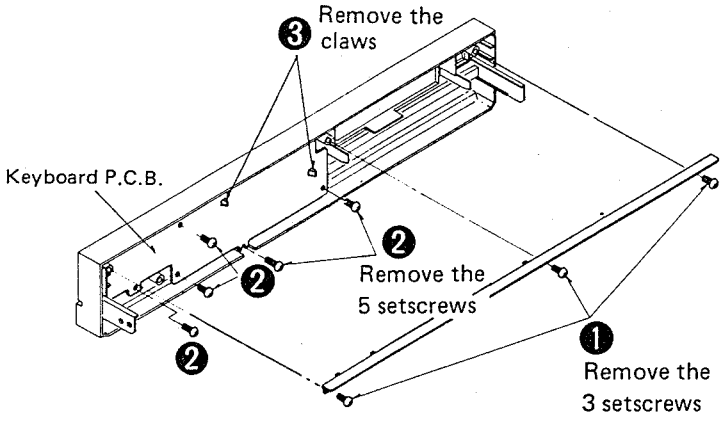
Note: **How to remove the flat cable**
Pull out the flat cable while pressing the connector.



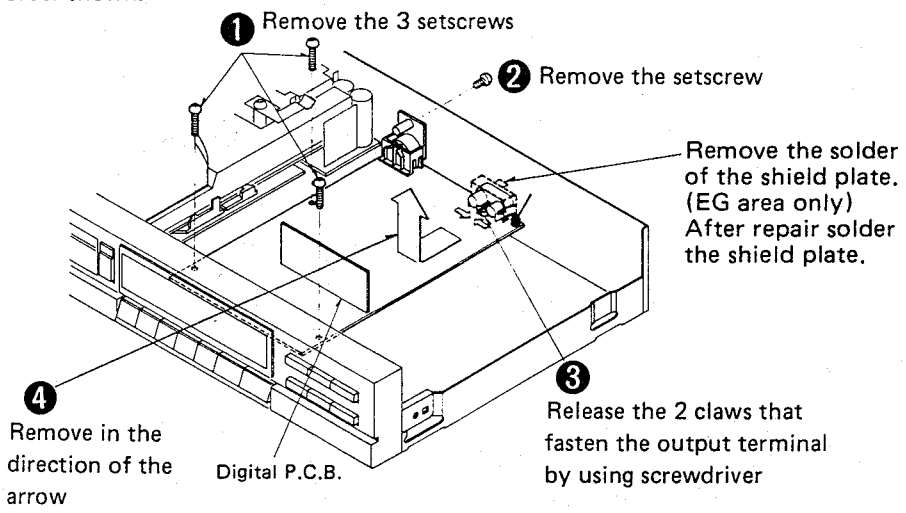
Ref. No. 3	How to remove the keyboard P.C.B.
Procedure 1➡2➡3	• Remove in the numerical order shown.

How to remove the operation buttons.

- Remove the keyboard P.C.B. and remove the operation button from the front panel.

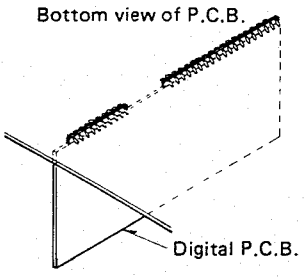


Ref. No. 4	How to remove the main P.C.B.
Procedure 1 ➡ 4	• Remove in the numerical order shown.


1 Remove the 3 setscrews
2 Remove the setscrew
Remove the solder of the shield plate. (EG area only) After repair solder the shield plate.
4
Remove in the direction of the arrow
Digital P.C.B.
3
Release the 2 claws that fasten the output terminal by using screwdriver

How to remove the digital P.C.B.

1. Remove the main P.C.B. and turn it over.
2. Remove the solder of the digital P.C.B. by using a solder sucker.



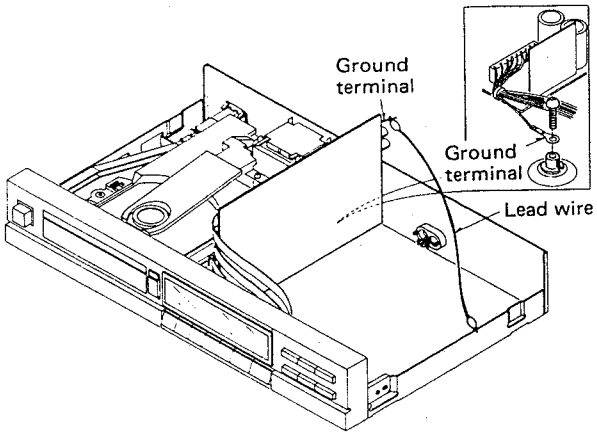
How to check the main P.C.B.

- When checking the soldered surfaces of the main P.C.B. and replacing the parts, do as shown.

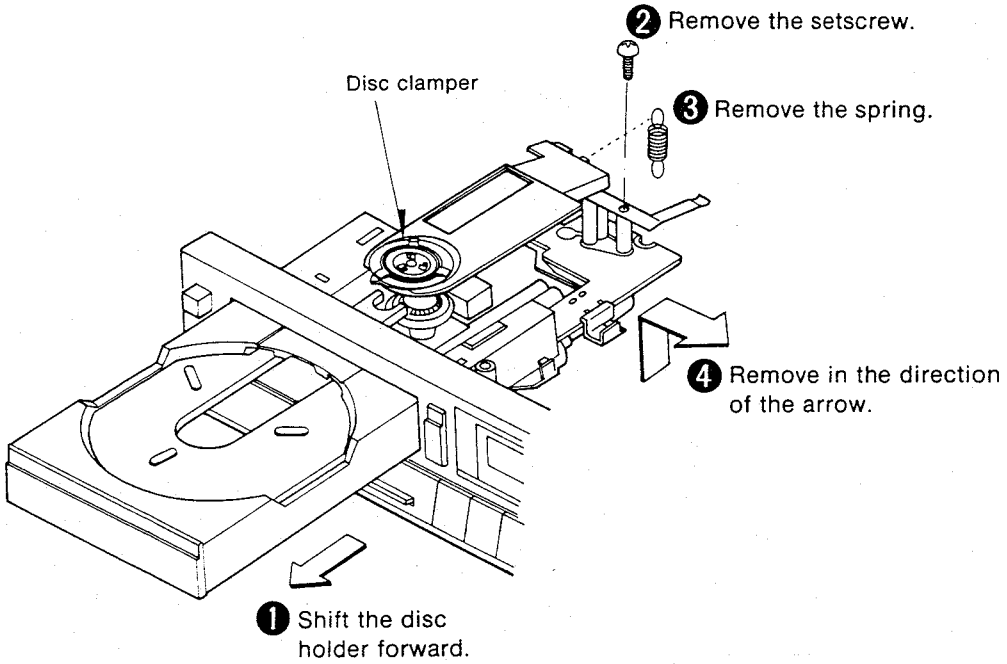
Cautions:

1. Be sure to connect the P.C.B. ground terminal (spring) and chassis lead wire.
2. Connect the power supply P.C.B. ground terminal to the chassis.
   (Do the job as shown by using the P.C.B. setscrew.)

Caution:
Connect the ground terminal of power supply P.C.B. to the chassis.

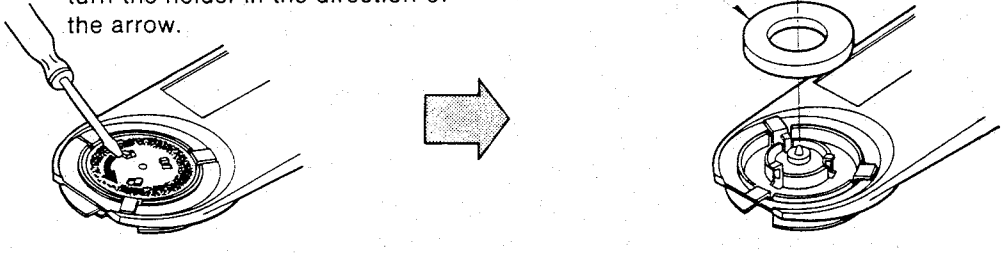


Ref. No. 5	How to remove the disc clamper
Procedure 1 ➡ 5	• Remove in the numerical order shown.


❷ Remove the setscrew.
Disc clamper
❸ Remove the spring.
❹ Remove in the direction of the arrow.
❶ Shift the disc holder forward.

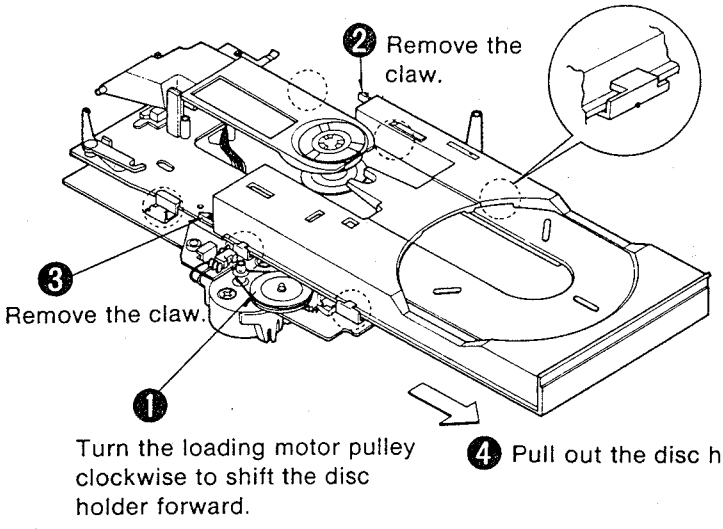
How to remove the magnet

- Insert a screwdriver between the magnet holder and clamper, then turn the holder in the direction of the arrow.

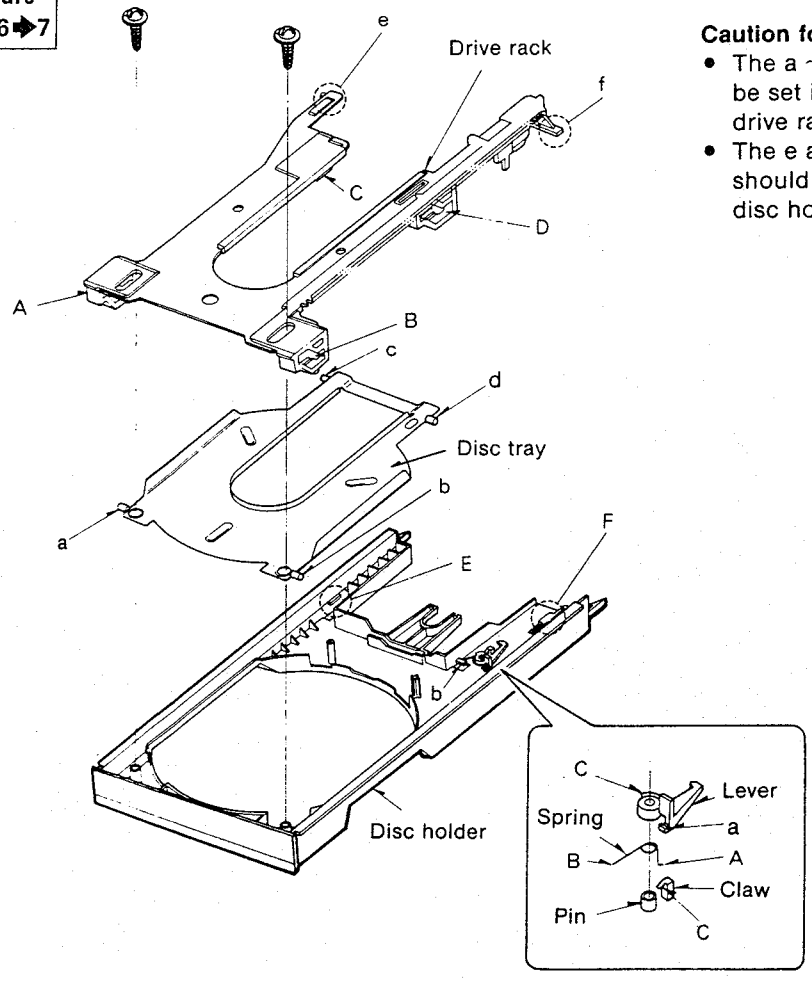


Ref. No. 6	How to remove the disc holder
Procedure 1 ➡ 2 ➡ 6	• Remove in the numerical order shown.

Caution for fitting
The disc holder should be fitted in the groove of loading base of 6 portions.


2 Remove the claw.
3 Remove the claw.
1 Turn the loading motor pulley clockwise to shift the disc holder forward.
4 Pull out the disc holder.

Ref. No. 7	How to remove the disc tray and drive rack
Procedure 1 ➡ 2 ➡ 6 ➡ 7	• Remove the 2 setscrews.



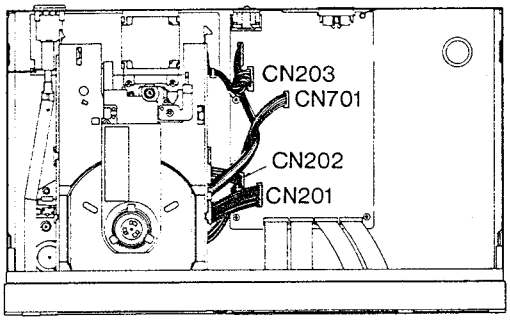
Caution for fitting
- The a ~ d of the disc tray should be set in grooves A ~ D of the drive rack.
- The e and f of the drive rack should be set in E and F of the disc holder.

Fitting of swing lever and spring
- Insert the spring into the pin, and fit the swing lever, matching part C of the swing lever with claw C.
- Match spring A to a and B to b.

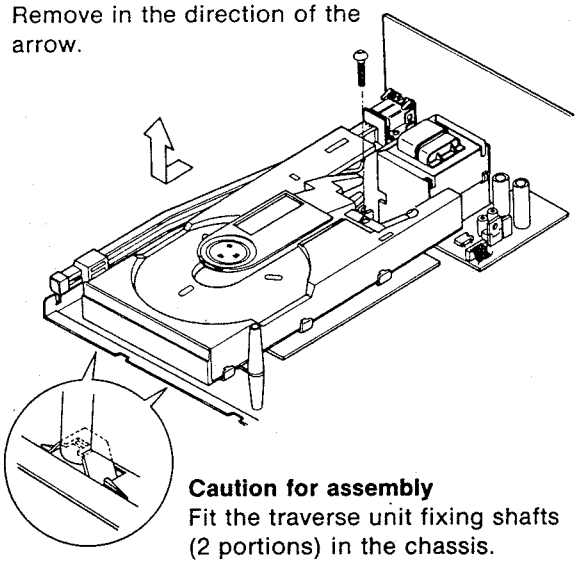
Ref. No. 8	How to remove the traverse unit ass'y (optical deck unit)
Procedure 1➡2➡8	• Remove the 4 connectors (CN201 ~ CN203, CN701).

Note: Locking the lock shaft at the bottom of the unit. (See page 3.)

1. Remove the setscrew.
2. Remove in the direction of the arrow.



Remove the front panel.

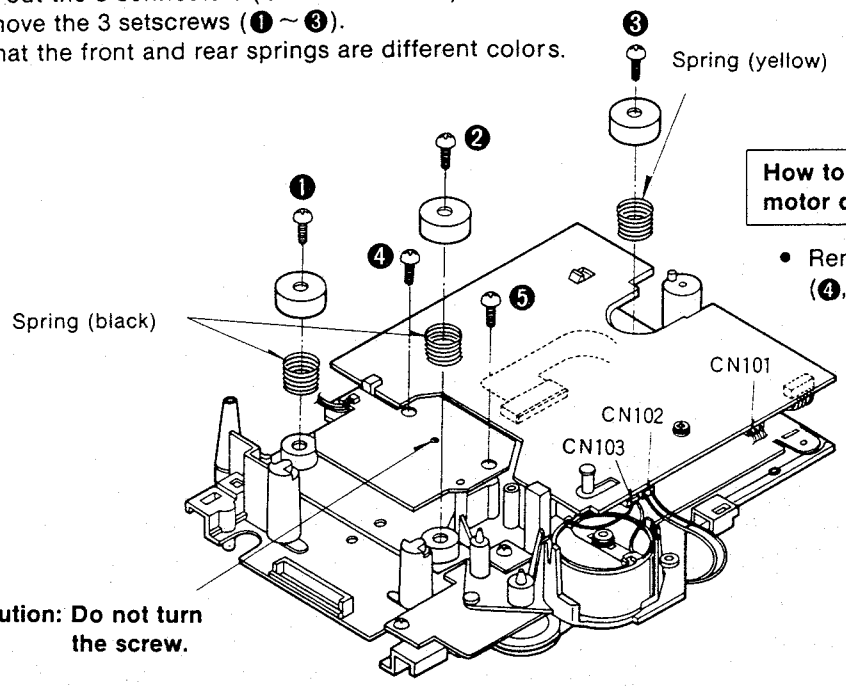


Caution for assembly
Fit the traverse unit fixing shafts (2 portions) in the chassis.

How to separate the traverse unit and disc holder

1. Turn over the traverse unit ass'y.
2. Pull out the 3 connectors (CN101 ~ CN103).
3. Remove the 3 setscrews (❶ ~ ❸).

Note that the front and rear springs are different colors.



Caution: Do not turn the screw.

How to remove the spindle motor drive P.C.B.

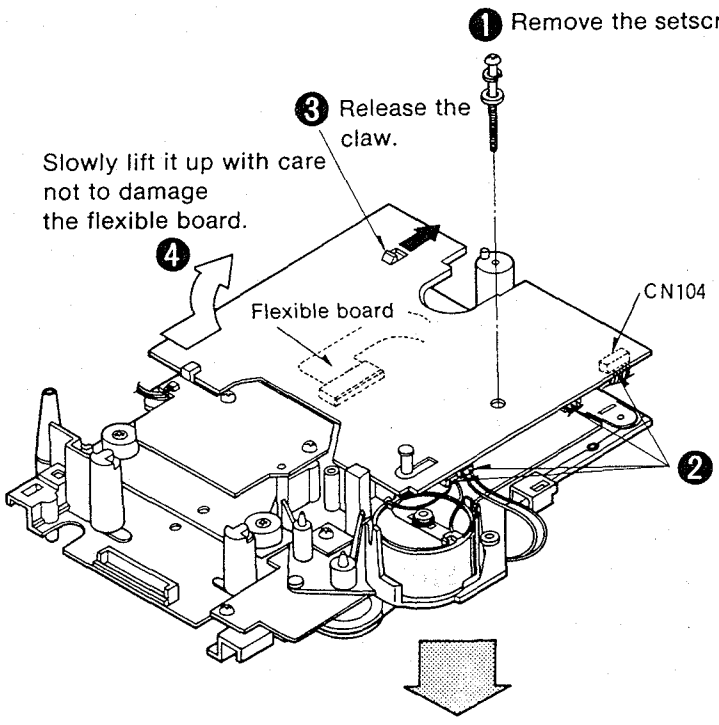
- Remove the 2 setscrews (❹, ❺).

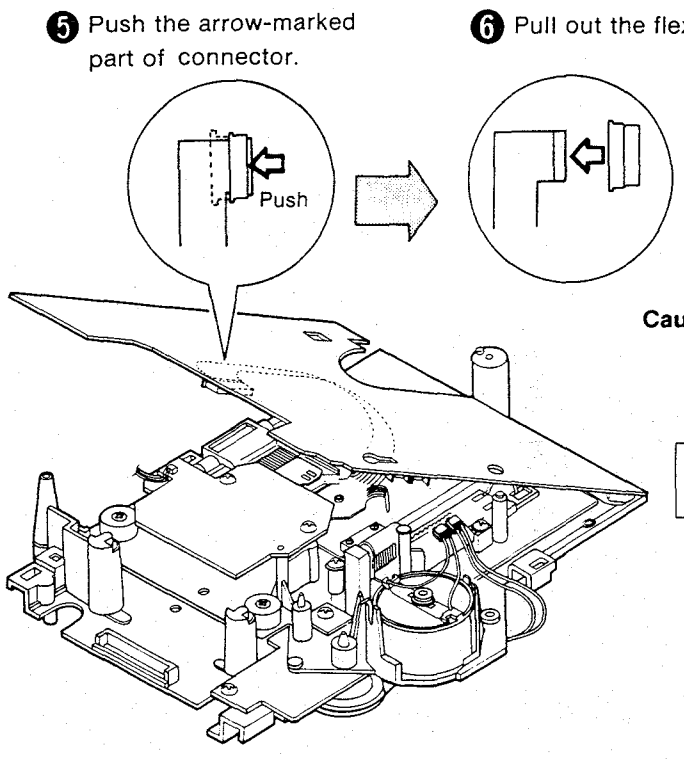
Ref. No. 9	How to remove the optical servo P.C.B.
Procedure 8 ➡ 9	

Refer to the optical pickup handling precautions (see page 7).

- Turn over the traverse unit ass'y and remove in the numerical order shown.

Cautons:
- When repairing with the optical servo P.C.B. opened, take special care not to cut off the flexible board of the optical pickup.
- When the flexible board is removed, insert the short pin into the board.


❶ Remove the setscrew.
❸ Release the claw.
Slowly lift it up with care not to damage the flexible board.
❹
Flexible board
CN104
❷ Pull out the 4 connectors (CN101 ~ CN104).

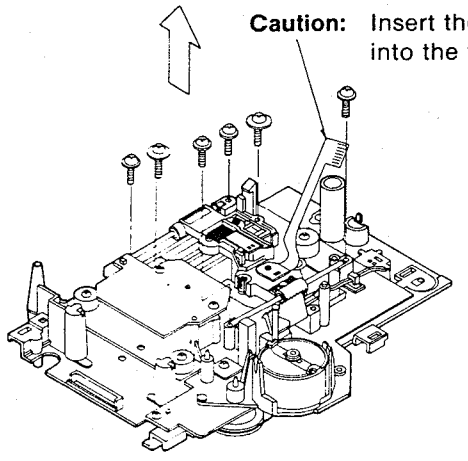


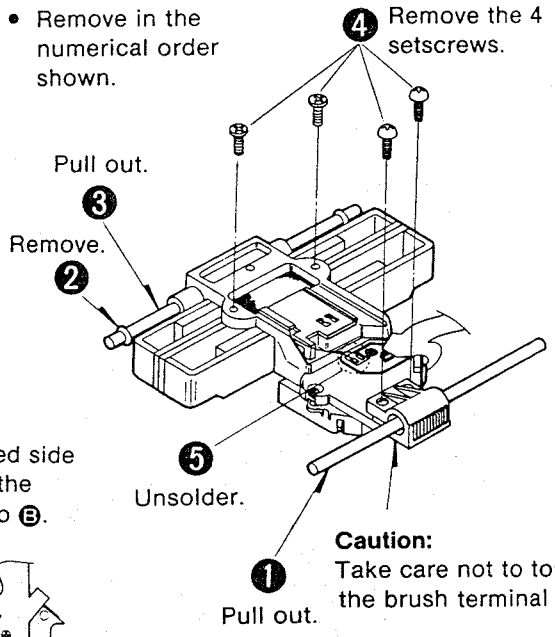
Caution: Insert the short pin into the flexible board in order to prevent breakdown of laser diode.

Refer to the optical pickup handling precautions (see page 7).

Ref. No. 10	How to remove the optical pickup
Procedure 8 ➡ 9 ➡ 10	• Remove the 6 setscrews.

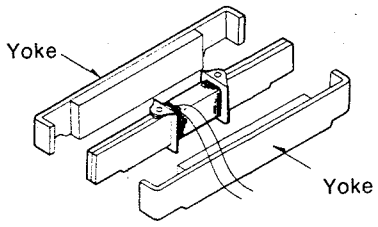
Refer to the optical pickup handling precautions (see page 7).





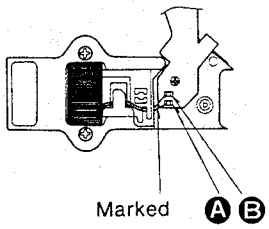
How to remove the drive coil

1. Remove the 2 yokes.
2. Pull out the drive coil.



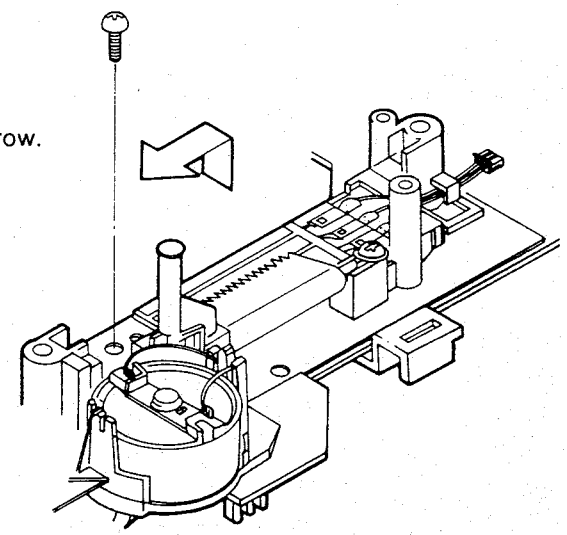
* DC resistance drive coil 36Ω±1.5Ω.

• **Drive coil fitting**
Solder the marked side of coil to Ⓐ and the unmarked side to Ⓑ.

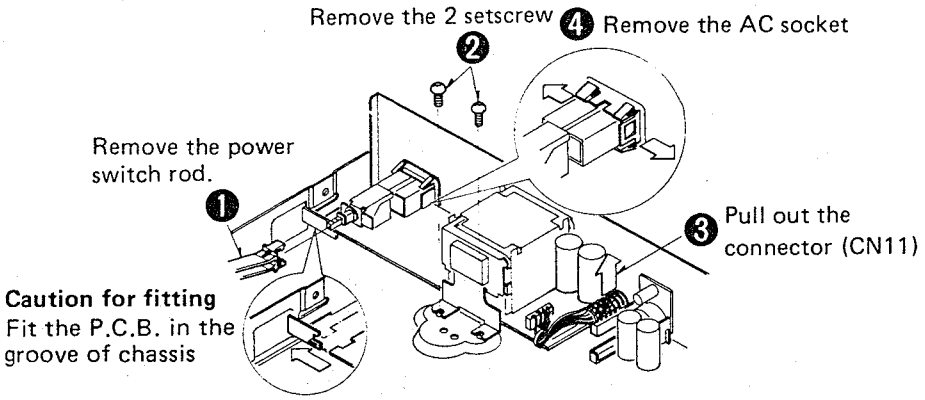


Ref. No. 11	How to remove the resistance unit (Optical pickup speed detection)
Procedure 10 ➡ 11	

1. Remove the setscrew.
2. Remove in the direction of the arrow.

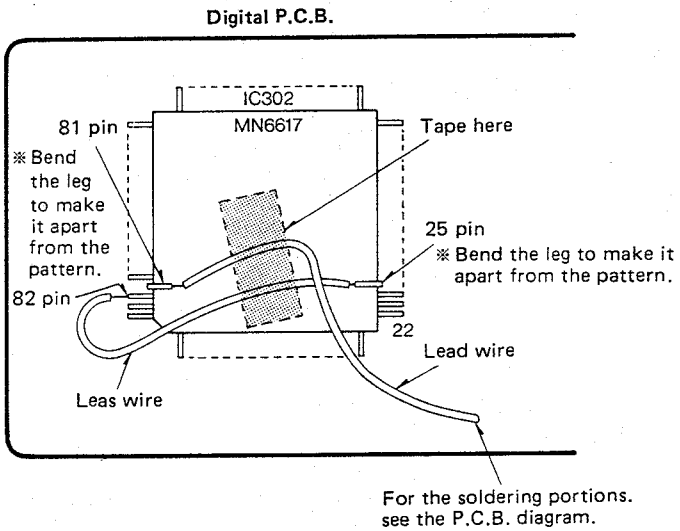


Ref. No. 12	How to remove the power supply P.C.B.
Procedure 8 ➡ 12	• Remove in the numerical order shown.

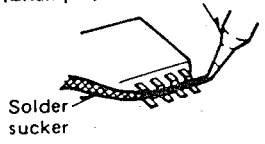
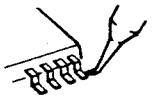
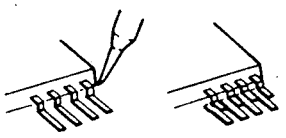
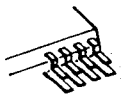

Remove the 2 setscrew
❷
❹ Remove the AC socket
Remove the power switch rod.
❶
❸ Pull out the connector (CN11)
Caution for fitting
Fit the P.C.B. in the groove of chassis

■ LEAD WIRE ARRANGMENT FOR DIGITAL P.C.B.

- When replacing MN6617 (IC302), arrange the lead wire as shown below.



■ HOW TO REPLACE IC'S (Small outline type)

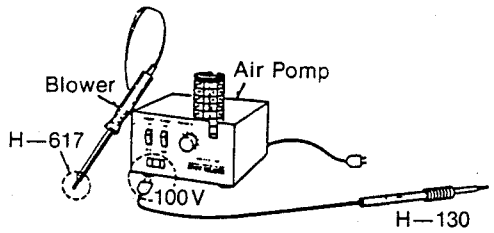
	Replacing procedure		Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H—130 	● **Recommended tool** .....Special soldering iron *H605M and H—130. *H605E and H—130. ● Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. ● When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. ● When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

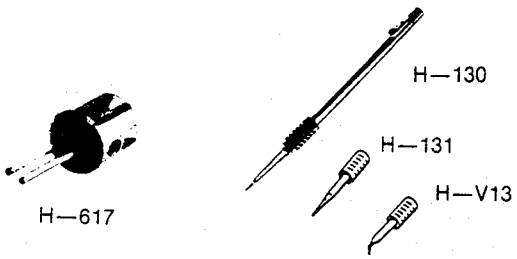
*** Special soldering iron**
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada
(Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

● H—605 Spot Heater (hot-air solder iron)

This device that uses hot air to melt solder was developed to remove Flat-Pakage ICs, RHCs and chip parts.

- H—605M (For 120V power source)
- H—605E (For 200V/220V/240V power source)





● H—617 Twin Nozzle (for spot heater)

Special nozzle for the removal of RHCs and chip resistors.
(Nozzle diameter : 1.0 mm x 2)

● H—130 Slim Pencil Solder Iron

An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs, etc., to high-density circuit boards.
Features:

- Rated power: 100V, 15W
- Max. temp.: 400°C
- Heater: ceramic (long life)
- Insulation resistance: 100MΩ
- Length: 178 mm
- Weight: 16 g (not including cord)

● H—131, H—V13 Cap Bits

Solder tip for the slim pencil Solder Iron and is composed of a bit holder and a corrosion resistance solder tip.
Permits changing of solder tips even while still hot.

- Solder tip: 0.3 mm

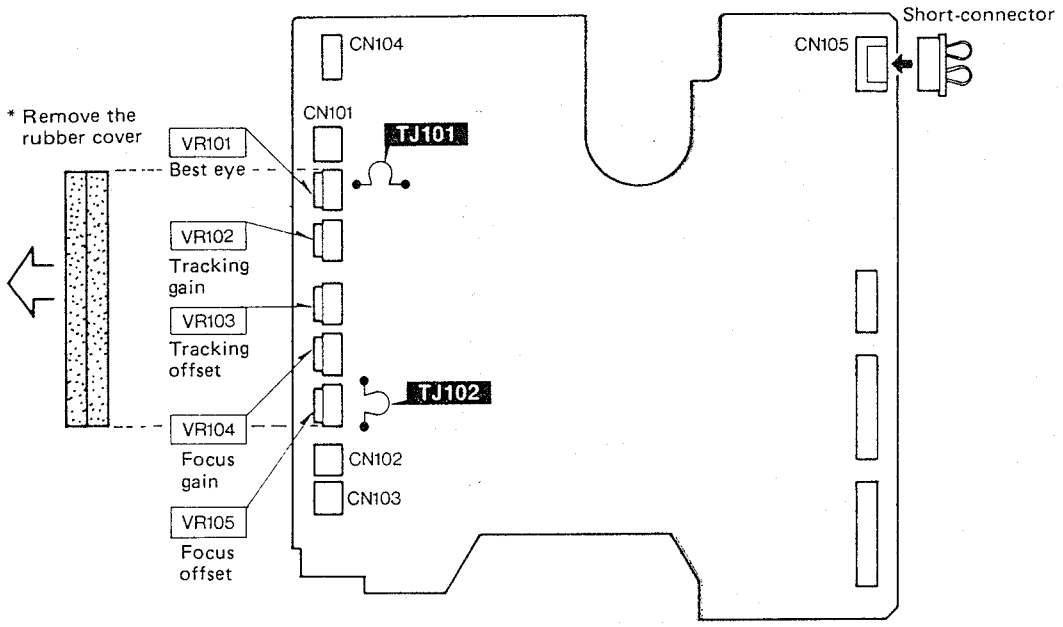
■ MEASUREMENTS AND ADJUSTMENTS

Caution:

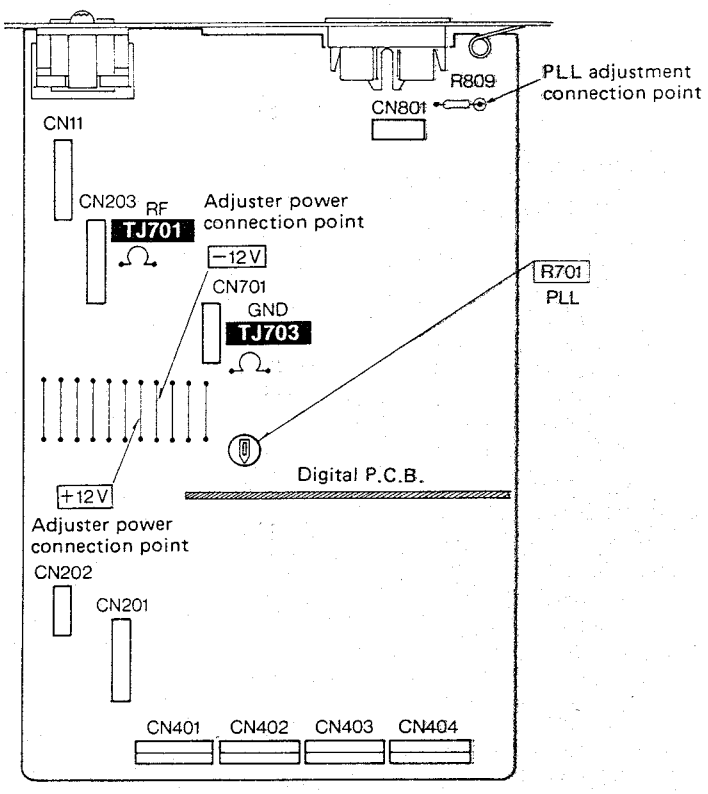
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pick-up lens. Be careful during adjustments in particular.
- The adjustment of this unit is basically the same as for SL-PJ11. (The adjusting points are partially different.) For the detail, refer to SL-PJ11 Service Manual (Order No. HAD8509261G0).

ADJUSTMENT POINTS

- **Servo P.C.B.**



- **Main P.C.B.**



ELECTRICAL ADJUSTMENT

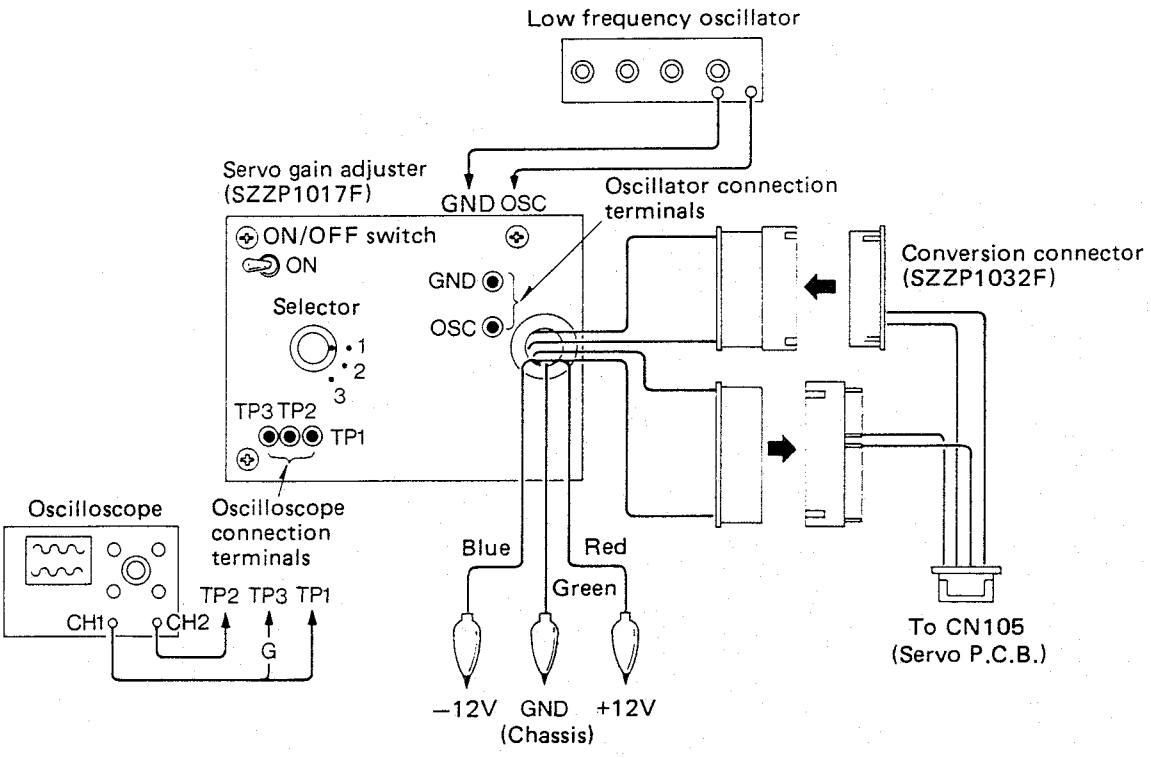
Equipment used

- Servo gain adjuster (SZZP1017F)
- Conversion connector (SZZP1032F)
- Two-channel oscilloscope (with trigger) of 30 MHz or over.
- Low frequency oscillator
- Test disc (SZZP1014F)
- Ordinary disc

Adjustment Procedure

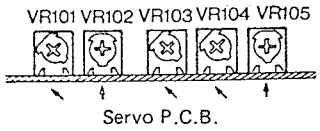
Step 1:	Remove the cabinet.	. . . . . Page 8
Step 2:	Connect the servo gain adjuster.	. . . . . Page 18
Step 3:	Temporary setting of each VR.	. . . . . Page 19
Step 4:	Focus gain adjustment	. . . . . Page 19
Step 5:	Tracking gain adjustment.	. . . . . Page 19
Step 6:	Best eye (PD balance) adjustment	. . . . . Page 19
Step 7:	Focus offset adjustment	. . . . . Page 20
Step 8:	Tracking offset adjustment	. . . . . Page 20
Step 9:	PLL adjustment	. . . . . Page 20
Step 10:	Check of operation after adjustment	. . . . . Page 21

Servo Gain Adjuster and Its Connection



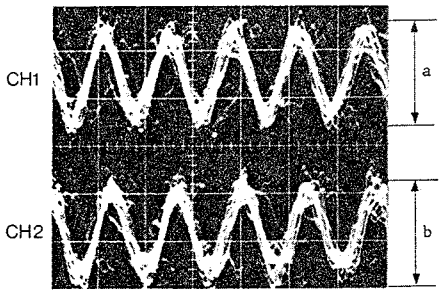
TEMPORARY SETTING OF EACH VR

1. Remove the rubber cover.
2. Temporarily set each VR of servo P.C.B. as shown.



FOCUS GAIN ADJUSTMENT

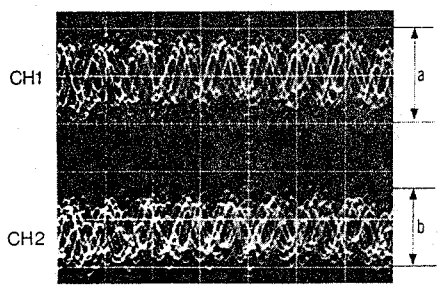
1. Adjust the low frequency oscillator to **750 Hz** frequency and **150 mVp-p** output voltage, and connect it to **OSC** and **GND** of servo gain adjuster.
2. Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster. **(TP3 grounded)**
   Oscilloscope setting: VOLT . . . . . .100 mV (both channels)
   SWEEP . . . . . .2 msec.
   INPUT . . . . . .AC
3. Set the servo gain adjuster switch to "**3**". (Set the controller ON · OFF switch to "**on**".)
4. Turn **on** the power switch and mount the test disc.
5. With the mode set to "play" 750 Hz signal appears on the oscilloscope. Then adjust **VR104** so that the waveform amplitudes on both channels are equal to each other.



Make a = b

TRACKING GAIN ADJUSTMENT

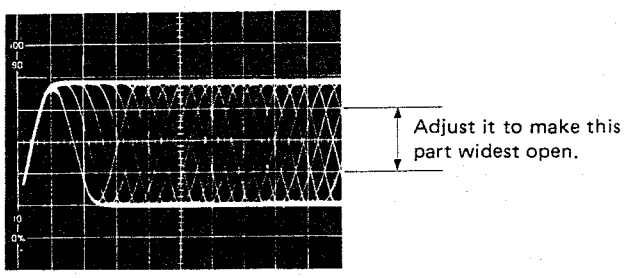
1. Adjust the low frequency oscillator to **1.2 kHz** frequency and **150 mVp-p** output voltage.
2. Change the oscilloscope setting, making the oscilloscope connection the same as mentioned above.
   Oscilloscope setting: VOLT . . . . . .100 mV (both channels)
   SWEEP . . . . . .0.5 msec.
   INPUT . . . . . .DC
3. Set the servo gain adjuster switch to "**1**".
4. With the mode set to "play", 1.2 kHz signal appears on the oscilloscope. Then adjust **VR102** so that the waveform amplitudes on both channels are equal to each other.
5. The servo gain adjuster is not necessary for other adjustments. So, disconnect the adjuster, **and insert the short connector of CN105 to the original position.**



Make a = b

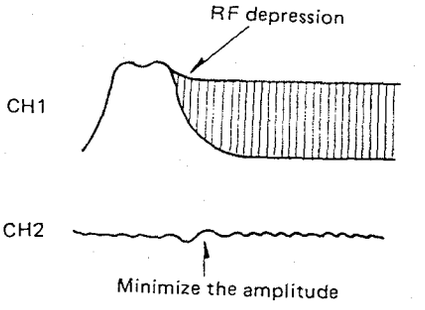
BEST EYE (PD BALANCE) ADJUSTMENT

1. Connect CH1 of the oscilloscope to **TJ701** (+) and **TJ703** (−) of the main P.C.B.
   Oscilloscope setting: VOLT . . . . . .200 mV
   SWEEP . . . . . .0.5 μsec.
   INPUT . . . . . .AC
2. Turn on the power supply and play the **bnad 13** (0.5 mm black spot) of the test disc.
3. Adjust **VR101** so that the eye pattern of RF signal is widest open.



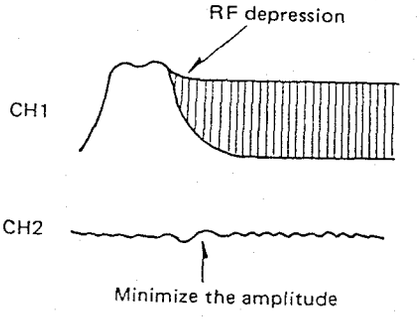
FOCUS OFFSET ADJUSTMENT

1. Connect CH1 of the oscilloscope to **TJ701** (+) and **TJ703** (−) to the main P.C.B. Connect CH2 to **TJ102** of servo P.C.B.
   Oscilloscope setting: VOLT . . . . . 500 mV (CH1)
   100 mV (CH2)
   SWEEP . . . . . 0.5 μsec.
   INPUT . . . . . AC (CH1)
   DC (CH2)
   MODE. . . . . NORM (Trigger on CH1)
2. Play the **band 13** (0.5 mm black spot) of test disc.
3. Trigger so that the waveform as shown appears on the oscilloscope, and adjust **VR105** to minimize the RF deression on CH1 and the wave amplitude on CH2.



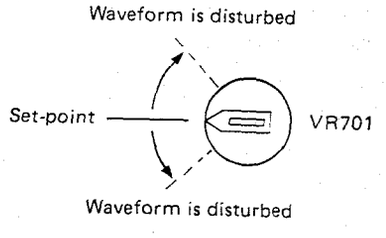
TRACKING OFFSET ADJUSTMENT

1. Connect CH1 of the oscilloscope to **TJ701** (+) and **TJ703** (−) to the main P.C.B. Connect CH2 to **TJ101** of servo P.C.B.
   Oscilloscope setting: VOLT . . . . . 500 mV (CH1)
   100 mV (CH2)
   SWEEP . . . . . 0.5 μsec.
   INPUT . . . . . AC (CH1)
   DC (CH2)
   MODE. . . . . NORM (Trigger on CH1)
2. Play the **band 13** (0.5 mm black spot) of test disc.
3. Trigger so that the waveform as shown appears on the oscilloscope, and adjust **VR103** to minimize the RF deression on CH1 and the wave amplitude on CH2.

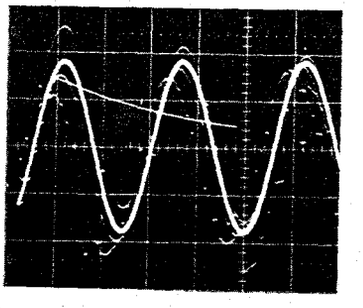


PLL ADJUSTMENT

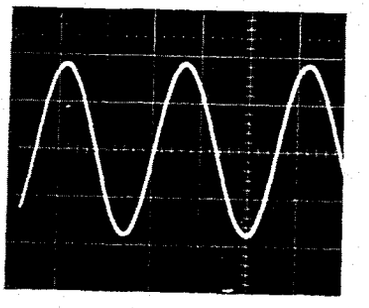
1. Connect CH1 of the oscilloscope to **R809** (+) and chassis (−) of the main P.C.B.
   Oscilloscope setting: VOLT 1V
   SWEEP . . . . . 1 msec
   INPUT . . . . . DC
2. Play the **band 13** (0.5 mm black spot) of the test disc.
3. Adjust **VR701** while observing the oscilloscope and set it in the middle of the range where the waveform is stable.



• **NG**



• **OK**



CHECK OF PLAY OPERATION AFTER ADJUSTMENT

- **Skip search check**

1. Play a common disc.
2. Push the skip button to check the skip search. (Both in forward and reverse modes).

- **Manual search check**

1. Play a common disc.
2. Push the manual search button to check that manual search can be smoothly made at low and high speeds. (Both in forward and reverse modes).

- **Check for defect**

1. Play the band 13 of the test disc to check that there is no sound skip or noise. (Black spot)
2. Play the band 14 of the test disc to check that there is no sound skip or noise. (Fingerprint)

OPTICAL PICKUP ADJUSTMENT

Equipment used

- Two-channel oscilloscope (with trigger) of 30 MHz or over.
- Hexagonal wrench (SZZP1044C)
- Test disc (SZZP1014F)

Adjustment Procedure

* If the optical pickup is replaced, adjust it according to the following procedure.

Step 1: Assemble the set to make it ready for power supply. . . . . Page 21

▼

Step 2: Temporary setting of each VR. . . . . Page 22

▼

Step 3: Turntable height adjustment. . . . . Page 22

▼

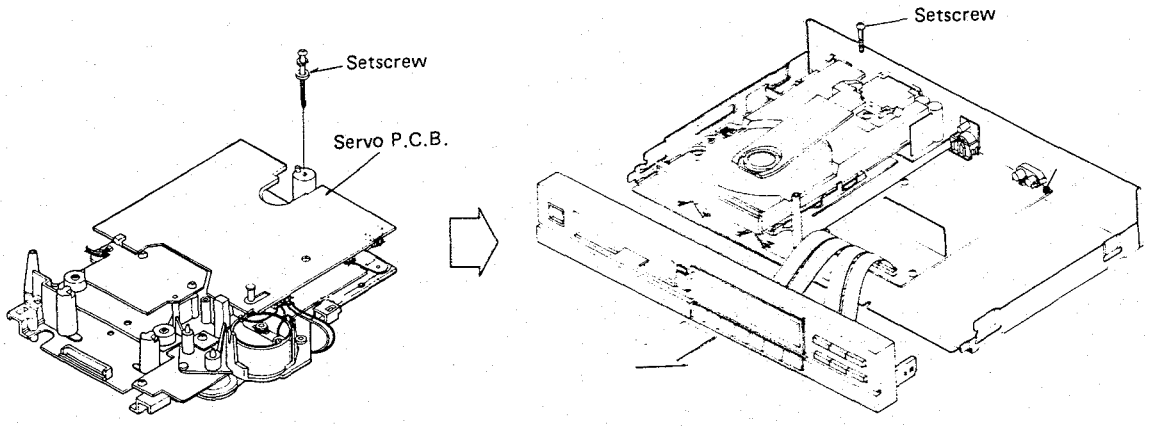
Step 4: Mechanical adjustment . . . . . Page 22

▼

Step 5: Electrical adjustment . . . . . Page 18

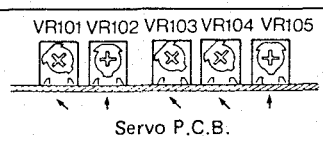
State of Setting

1. Before assembling the set, remove the setscrew of servo P.C.B.
2. Remove the loading base setscrew.
3. Pull out the front panel.



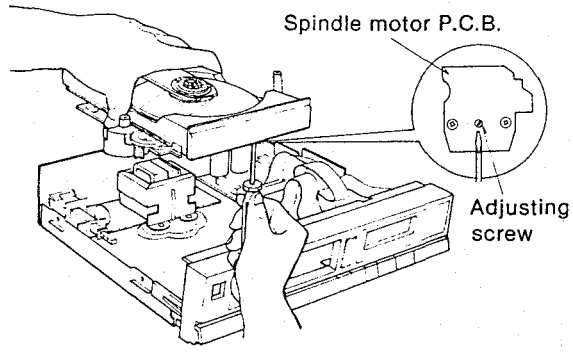
TEMPORARY SETTING OF EACH VR

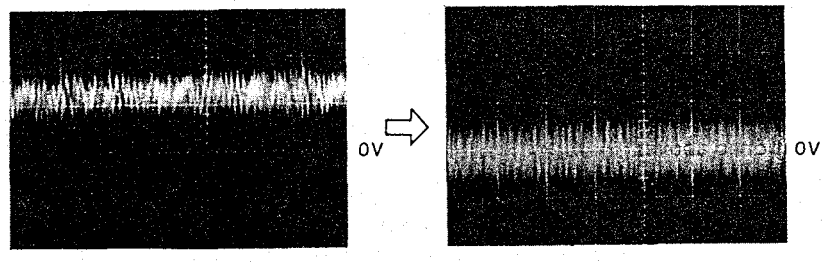
1. Remove the rubber cover.
2. Temporarily set each VR of the servo P.C.B. shown.



TURNTABLE HEIGHT ADJUSTMENT

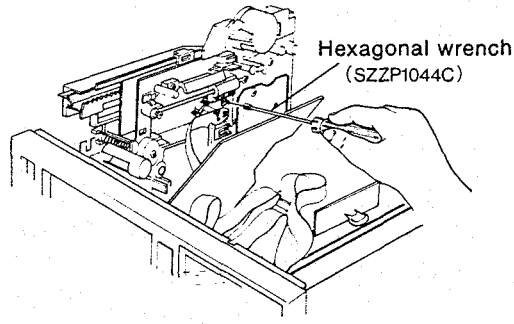
1. Connect the oscilloscope to **TJ101** (+) and chassis (–) of servo P.C.B.
   Oscilloscope setting: VOLT . . . . . 100 mV
   SWEEP . . . . . 5 msec.
   INPUT . . . . . DC
2. Turn on the power switch and mount the test disc.
3. Set the DC zero balance of oscilloscope.
4. Play the test disc.
5. Hold up the loading unit by hand during play.
   Caution: Hold the unit horizontally without giving it vibrations.
6. Turn the adjusting screw so that the voltage at the waveform center of the oscilloscope is **0V**.
   Caution: Do not turn the adjusting screw excessively.
7. After the adjustment, apply screw-lock bond to the adjusting screw.

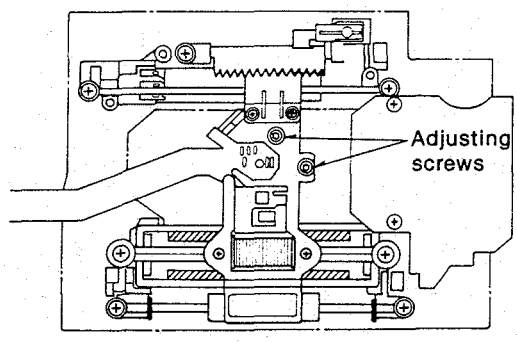


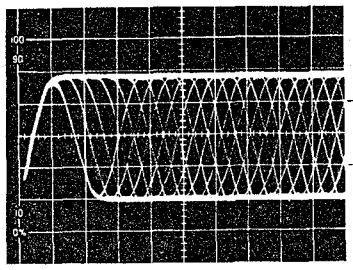


MECHANICAL ADJUSTMENT

1. Connect the oscilloscope to **TJ701** (+) and **TJ703** (–) of the main P.C.B.
   Oscilloscope setting: VOLT 0.5V
   SWEEP . . . . . 0.5 μsec.
   INPUT . . . . . AC
2. Turn on the power switch and mount the test disc.
3. Play the test disc.
4. Set the unit as shown with care not to give vibrations to the loading unit.
5. Pull out the connectors (CN101 ~ 103) of the servo P.C.B.
6. Alternately turn the optical pickup adjusting screws (2 pcs) with hexagonal wrench (SZZP1044C) so that the eye pattern of the waveform (RF signal) of the oscilloscope is widest open.
   Cautions:
   1. Take care not to damage the flexible board of optical pickup during adjustment.
   2. Before installing the servo P.C.B., make sure that the condenser on the board is laid down.







ELECTRICAL ADJUSTMENT

1. Fit the loading unit to the chassis.
2. Follow the procedure of "**Electrical adjustment**" mentioned earlier.

■ TEST DISC (SZZP1014F) CONTENTS

TNO.	PURPOSE	SIGNAL	Time
		(TOC)	
1	Servo adjustment	Wowble Tone –10 dB L + R	2'00"
2	Pickup assenmety adjustment	Wawble Tone –10 dB L + R	5'00"
3	Reference	1 kHz 0 dB L + R	1'00"
4	Freq. Response	20 kHz 0 dB L + R	0'30"
5	Emphasis	16 kHz –0.96 L + R	0'30"
6	Channel Separation	L 1 kHz 0 dB R – ∞	0'30"
7	Channel Separation	R 1 kHz 0 dB L – ∞	0'30"
8	Dynamic range	1 kHz –60 dB L + R	1'00"
9	Linearity	1 kHz –80 dB L + R	1'00"
10	S/N	– ∞	2'00"
11	THD	1 kHz 0 dB L + R	1'00"
12	Black Spot	Wowble Tone –10 dB L + R	5'00"
13	Black Spot	Wowble Tone –10 dB L + R	5'00"
14	Finger Print	Wowbel Tone –10 dB L + R	5'00"
15	Finger Print	Wowble Tone –10 dB L + R	9'00"
16	Wedge	Wowble Tone –10 dB L + R	4'00"
17	Wedge	Wowble Tone –10 dB L + R	4'00"
18	Reference	1 kHz 0 dB L + R	0'30"

TNO.	PURPOSE	SIGNAL	Time
19	Freq. Response	15 Hz	0'30"
20	Freq. Response	20	0'30"
21	Freq. Response	50	0'30"
22	Freq. Response	100	0'30"
23	Freq. Response	200	0'30"
24	Freq. Response	500	0'30"
25	Freq. Response	2K	0'30"
26	Freq. Response	5K	0'30"
27	Freq. Response	10K	0'30"
28	Freq. Response	12K	0'30"
29	Freq. Response	15K	0'30"
30	Freq. Response	18K	0'30"
31	Freq. Response	20K	0'30"
32	Channel Separation	L 100 Hz 0 dB R – ∞	0'30"
33	Channel Separation	R 100 Hz 0 dB L – ∞	0'30"
34	Channel Separation	L 10 kHz 0 dB R – ∞	0'30"
35	Channel Separation	R 10 kHz 0 dB L – ∞	0'30"
36	Channel Separation	L 20 kHz 0 dB L – ∞	0'30"
37	Channel Separation	R 20 kHz 0 dB L – ∞	0'30"

■ TROUBLESHOOTING

Notes:

1. Carefully handle the compact disc because stain, dust or warping may cause generation of noise.
2. For the voltage value and waveform, refer to the schematic diagram. (The voltage value and waveform slightly varies depending on the measuring set and tester.)
3. Possible defects are mainly shown by the name of semi-conductor. The adjacent electronic circuits (such as C and R) are omitted.

• Check the power supply circuit

Check the 12V power supply
(positive and negative voltage)
[IC103, 104, 201,
801~804
Focus·tracking Error amp.
Coil drive and Traverse servo]

Check the voltage of D1 terminals ⊕, ⊖.
NO → AC cord, S1, D1, T1 } defective

YES

Check the voltage of IC1, 2 terminals ⓞ.
NO → IC1, IC2 } defective

YES

Check the FL power supply.
(FL illuminate)

Check the voltage of BTI terminal ①, ②.
NO → T1 defective

YES

Check the collector voltage of Q13.
NO → Q13, D15 } defective

YES

Check the 11.4V power supply
(positive and negative voltage)
[Q102~Q109
Focus and tracking coil drive,
Traverse coil drive, Loading
motor drive]

Check the voltage of D2 terminals ⊕, ⊖.
NO → D2, T1 } defective

YES

Check the voltage of IC4, 5 terminals.
NO → IC4, IC5 } defective

YES

Check the 7.8V power supply
(positive and negative voltage)
[IC501
Spindle motor drive]

Check the emitter voltages of Q11, 12
NO → Q11, 12, D11, 12 } defective

Ⓐ

YES (Ⓐ)

Check the 5V power supply
(positive and negative voltage)
[IC101, Q101
Focus servo, tracking servo
and Laser power control]

Check the emitter voltages of Q110, 111
NO → Q110, 111, D101, 102 } defective

YES

Check the 5V power supply
(positive and negative voltage)
[IC202, 301~304, 401, 402,
501, 601
Digital circuit, Data slice,
PLL, System control, FL
drive, Muting relay drive]

Check the voltage of IC11, 12 terminals ⓞ.
NO → IC11, IC12 } defective

• Check the focus servo

Check the power supply circuit.

YES

Reset signal level is "H"? (IC402 ③)
NO → IC402 defective

YES

Clock is oscillated (4.2336 MHz)? (IC302 ⑫)
NO → IC301, IC302 } defective

YES

Focus ON signal level is "L"? (IC401 ㊱)
NO → IC401, IC102 } defective

YES

Laser APC signal is ON?
IC101 ⑤ : H
Q101 Ⓒ : L
NO → IC101, Q101 } defective

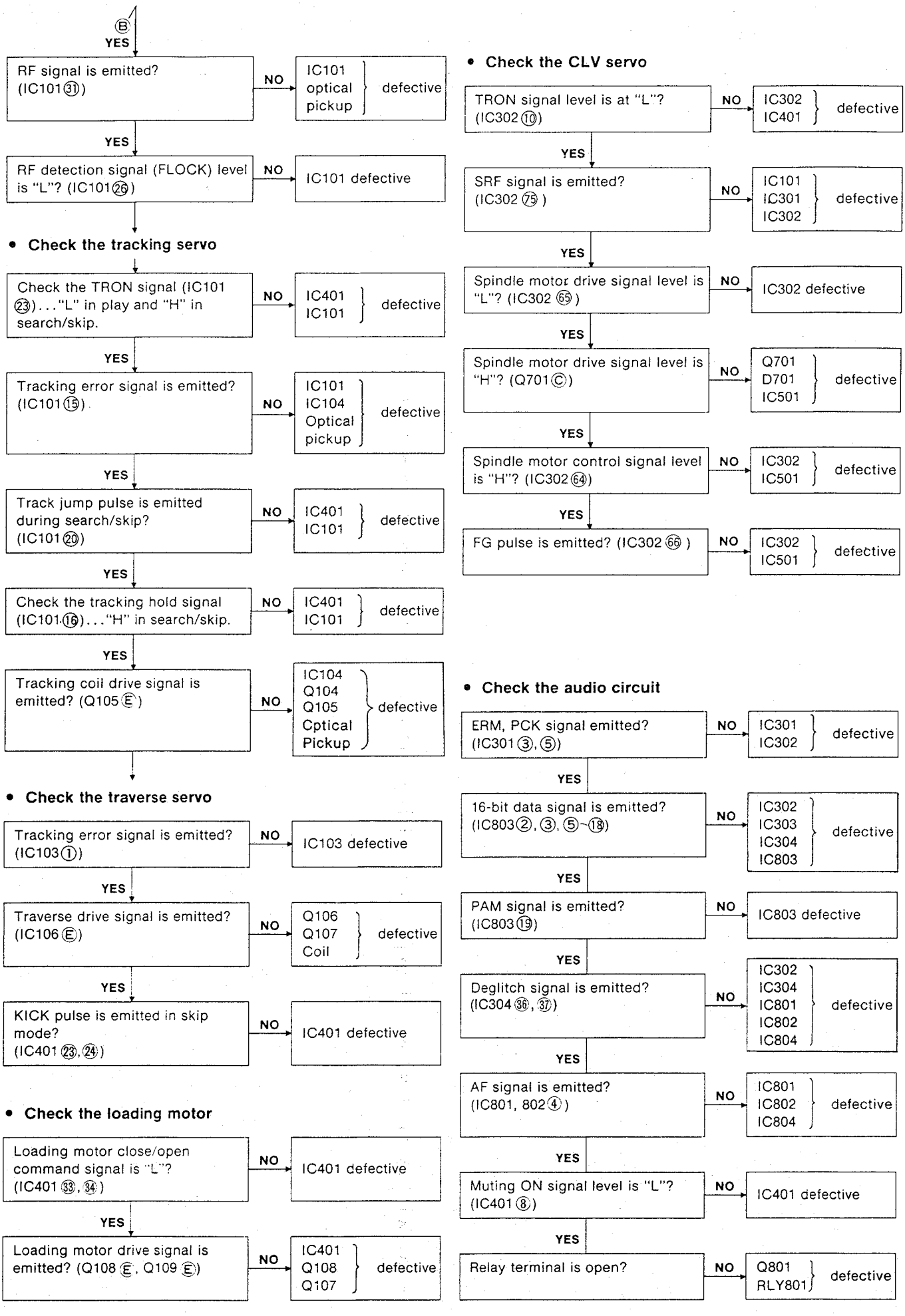
YES

Focus search signal (triangular wave) is emitted? (IC101 ㉟)
NO → IC101 defective

YES

Focus lens moves up and down for a few seconds?
(Not needed to set the disc)
NO → IC104, Q102, 103 optical pickup } defective

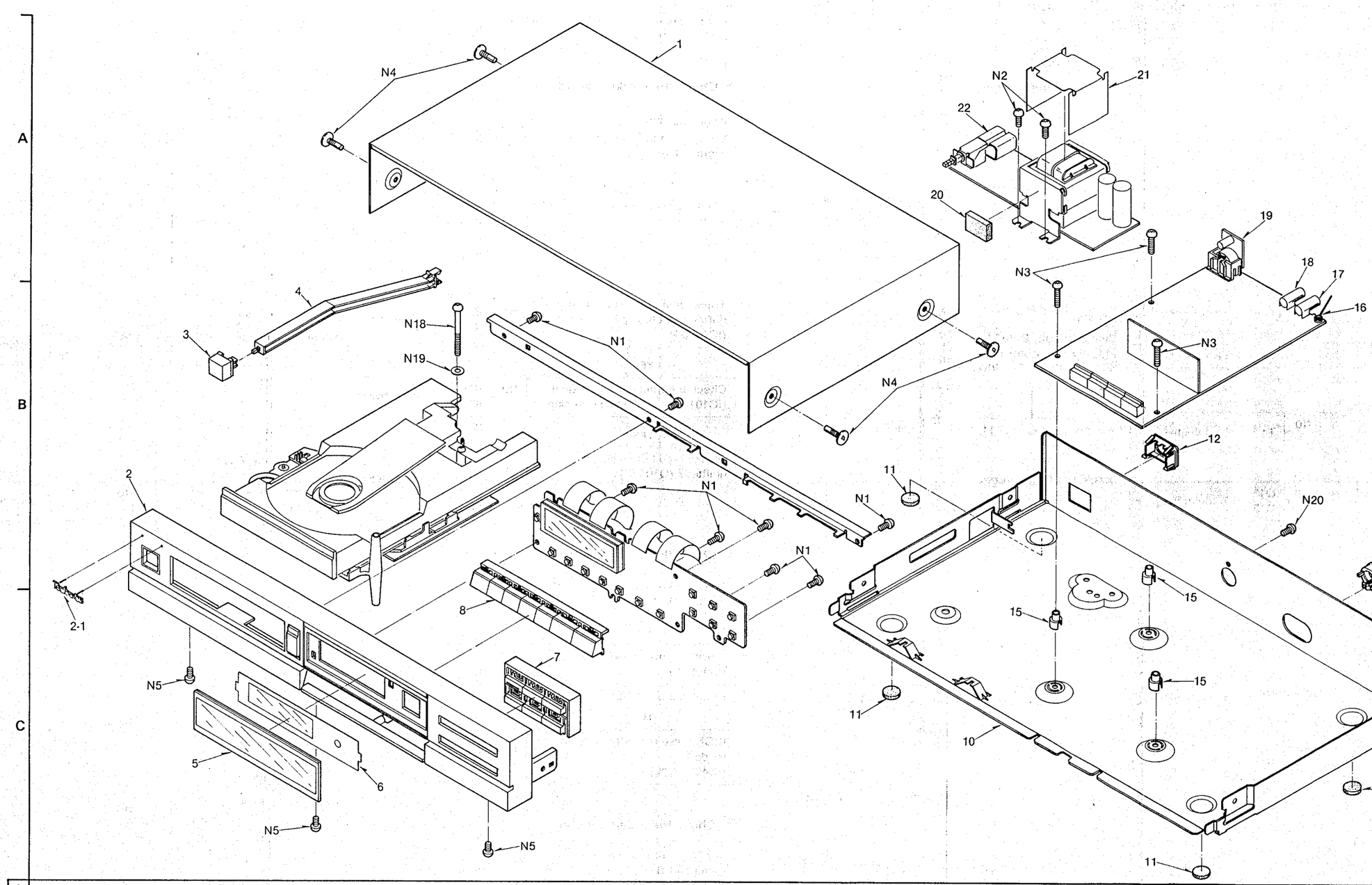
Ⓑ


Ⓑ
YES
RF signal is emitted? (IC101㉛)
NO
IC101 optical pickup
defective
YES
RF detection signal (FLOCK) level is "L"? (IC101㉖)
NO
IC101 defective
• Check the tracking servo
Check the TRON signal (IC101 ㉓)..."L" in play and "H" in search/skip.
NO
IC401 IC101
defective
YES
Tracking error signal is emitted? (IC101⑮)
NO
IC101 IC104 Optical pickup
defective
YES
Track jump pulse is emitted during search/skip? (IC101⑳)
NO
IC401 IC101
defective
YES
Check the tracking hold signal (IC101⑯)..."H" in search/skip.
NO
IC401 IC101
defective
YES
Tracking coil drive signal is emitted? (Q105Ⓔ)
NO
IC104 Q104 Q105 Cptical Pickup
defective
• Check the traverse servo
Tracking error signal is emitted? (IC103①)
NO
IC103 defective
YES
Traverse drive signal is emitted? (IC106Ⓔ)
NO
Q106 Q107 Coil
defective
YES
KICK pulse is emitted in skip mode? (IC401㉓,㉔)
NO
IC401 defective
• Check the loading motor
Loading motor close/open command signal is "L"? (IC401㉝,㉞)
NO
IC401 defective
YES
Loading motor drive signal is emitted? (Q108Ⓔ, Q109Ⓔ)
NO
IC401 Q108 Q107
defective
• Check the CLV servo
TRON signal level is at "L"? (IC302⑩)
NO
IC302 IC401
defective
YES
SRF signal is emitted? (IC302㉕)
NO
IC101 IC301 IC302
defective
YES
Spindle motor drive signal level is "L"? (IC302㊺)
NO
IC302 defective
YES
Spindle motor drive signal level is "H"? (Q701Ⓒ)
NO
Q701 D701 IC501
defective
YES
Spindle motor control signal level is "H"? (IC302㊹)
NO
IC302 IC501
defective
YES
FG pulse is emitted? (IC302㊻)
NO
IC302 IC501
defective
• Check the audio circuit
ERM, PCK signal emitted? (IC301③,⑤)
NO
IC301 IC302
defective
YES
16-bit data signal is emitted? (IC803②,③,⑤~⑱)
NO
IC302 IC303 IC304 IC803
defective
YES
PAM signal is emitted? (IC803⑲)
NO
IC803 defective
YES
Deglitch signal is emitted? (IC304㊱,㊲)
NO
IC302 IC304 IC801 IC802 IC804
defective
YES
AF signal is emitted? (IC801, 802④)
NO
IC801 IC802 IC804
defective
YES
Muting ON signal level is "L"? (IC401⑧)
NO
IC401 defective
YES
Relay terminal is open?
NO
Q801 RLY801
defective

SL-P100

■ EXPLODED VIEWS

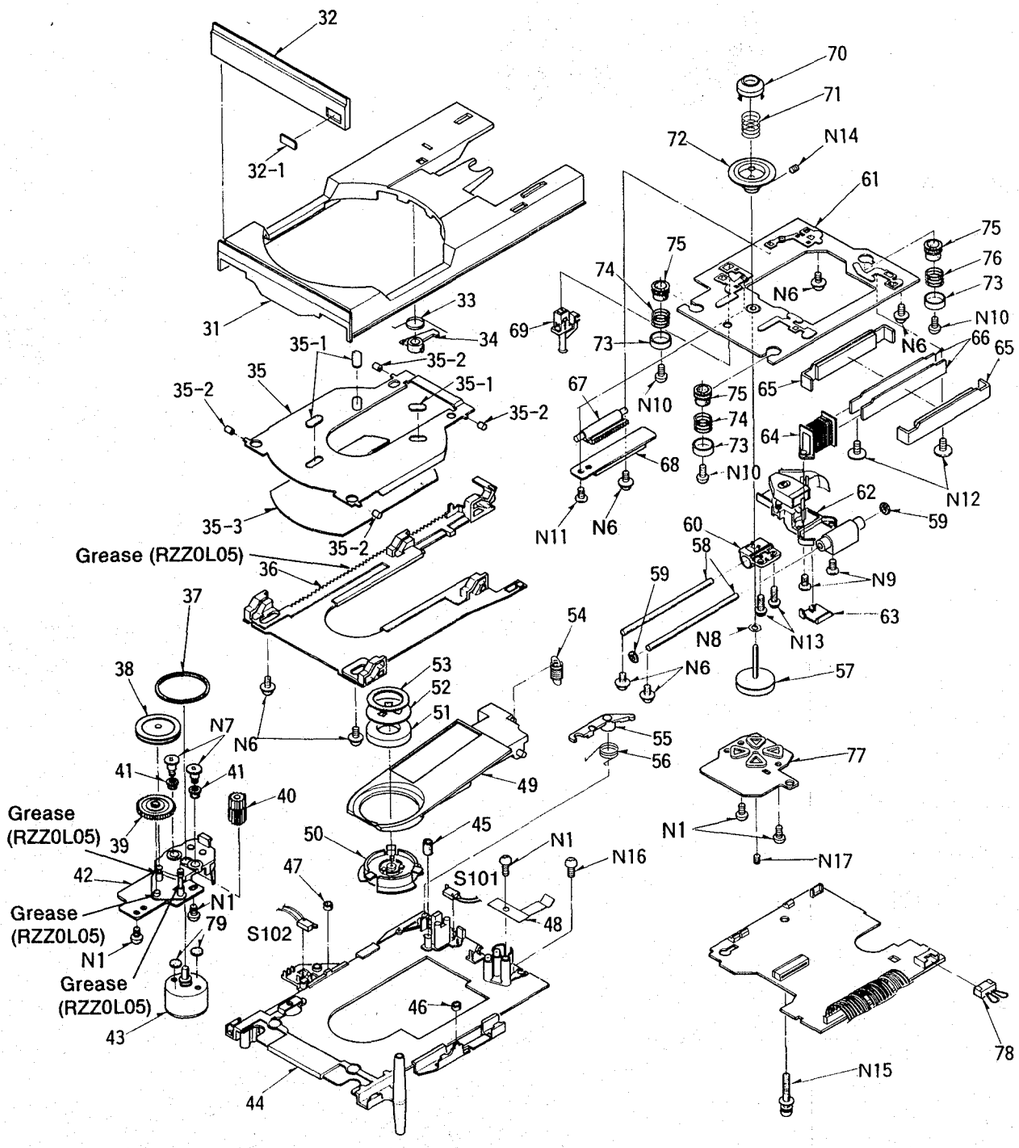
- Cabinet and chassis parts



| | | |

SL-P100

- **Travers deck parts**



A
B
C
D
E
F

| | | |

■ REPLACEMENT PARTS LIST

Color

(K).... Black Type
(S).... Silver Type

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The " S " mark is service standard parts and may differ from production parts.
5. Ⓚ-marked parts are used for black only, while ○-marked parts are for silver type only.
6. Part other than Ⓚ-and ○-marked are used for both black and silver types.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

Color	Areas
(K) (S)	[M]..... U.S.A.
(K) (S)	[MC]... Canada.
(K) (S)	[E]..... Switzerland and Scandinavia.
(K) (S)	[EK].... United Kingdom.
(K) (S)	[XL].... Australia.
(K) (S)	[EG].... F.R. Germany.
(K) (S)	[EB].... Belgium.
(K) (S)	[EH].... Holland.
(K) (S)	[EF].... France.
(K) (S)	[Ei]..... Italy.
(K) (S)	[XA].... Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
(K) (S)	[PA].... East PX.
(K) (S)	[PE].... European Military.
(K) (S)	[PC].... European Audio Club.

Ref. No.		Part No.	Description
INTEGRATED CIRCUITS			
IC1		AN78M12	IC
IC2		AN79N12	IC
IC4, 5	⚠	SVIFU15	IC
IC11	⚠	AN78M05	IC
IC12	⚠	AN79N05	IC
IC101		AN8370S	IC
IC102		MN4053BS	IC
IC103, 104		AN6554NS	IC
IC201		AN6552	IC
IC202		AN6914	IC
IC301		AN8371S	IC
IC302		MN6617F	IC
IC303		MN4416S−12	IC
IC304		MN6618F	IC
IC401		MN15261PDC1	IC
IC402		MN1280−R	IC
IC501		AN8280LF	IC
IC801		SVIAL075L	IC
IC802		SVIAL075R	IC
IC803		SVIPCM54KP	IC
IC804		SVILM833NA	IC
TRANSISTORS			
Q11		2SD973	Transistor
Q12		2SB793	Transistor
Q13		2SA1309	Transistor
Q101		2SC2021	Transistor
Q102	⚠	2SD1055	Transistor
Q103	⚠	2SB822	Transistor
Q104	⚠	2SD1055	Transistor
Q105	⚠	2SB822	Transistor
Q106	⚠	2SD1055	Transistor
Q107	⚠	2SB822	Transistor
Q108	⚠	2SD1055	Transistor
Q109, 110	⚠	2SB822	Transistor
Q111	⚠	2SC2021	Transistor
Q201		2SK301	FET
Q202		UN4212	Transistor
Q203		2SA1309	Transistor
Q601−603		UN4212	Transistor

Ref. No.		Part No.	Description
TRANSISTORS			
Q701		UN4212	Transistor
Q801		UN4112	Transistor
DIODES			
D1, 2	⚠	SVDS1WB40	Rectifier
D3	⚠	SVD1SR35200V	Rectifier
D11, 12		MA4082	Zener Diode
D13		MA4330	Zener Diode
D14		MA4082	Zener Diode
D101, 102		MA4056	Zener Diode
D401−403		MA165	Diode
D600−603, 605, 607		MA165	Diode
D701		MA4091	Zener Diode
D801, 802		MA4056	Zener Diode
D803		MA165	Diode
CRYSTAL			
X301		SVQ16CKSS	
VARIABLE RESISTORS			
VR101		EVND1AA00B53	Variable Resistor, 5kΩ(B)
VR102, 103		EVND1AA00B14	Variable Resistor, 10kΩ(B)
VR104		EVND1AA00B53	Variable Resistor, 5kΩ(B)
VR105		EVND1AA00B14	Variable Rresistor, 10kΩ(B)
VR701		EVN38CA00B13	Variable Resistor, 1kΩ(B)
RELAY			
RLY801		SFDYG5A237P	Muting

Ref. No.		Part No.	Description
SWITCHES			
S1	⚠	ESB823V	Power
S2 [XA, PA, PE, PC] only	⚠	SRDSHXW0251	Voltage Selector
S101, 102		SRDSMLS−2	Open/Close
S601, 602, 604−612, 616, 623, 624		EVQQS405K	Operation
POWER TRANSFORMER			
T1 [M]	⚠	SLT54JL14A	Power Source
T1 [MC]	⚠	SLT54JS27C	Power Source
T1 [EK, XL]	⚠	SLT54JE28E	Power Source
T1 [XA, PA, PE, PC]	⚠	SLT54JS30E	Power Source
T1 [Other areas]	⚠	SLT54JS29E	Power Source
COMPONENT COMBINATION			
C2, 3	⚠	EXRFS203ZS	0.01μF×2
FLUORESCENT DISPLAY TUBE			
FL601		SADD1	Display
HALL ELEMENT			
H501, 502		OH−003	Hall Element
FUSES			
F1 [XA, PA, PE, PC] only	⚠	XBA2C03TB0	250V, T315mA
F1 Except for [M, MC]	⚠	XBA2C016TB0	250V, T160mA
F2 [XA, PA, PE, PC] only	⚠	XBA2C016TB0	250V, T160mA

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1	○	SKCD10−0S	Cabinet	(1)
1	Ⓚ	SKCD10−0K	Cabinet	(1)
2	○	SYYD100SME	Front Panel	(1)
2	Ⓚ	SYYD100KME	Front Panel	(1)
2-1	○	SGB628	Badge	(1)
2-1	Ⓚ	SGB628−1	Badge	(1)
3	○	SBC666	Button	(1)
3	Ⓚ	SBC666−3	Button	(1)
4		SUBD2−1	Rod	(1)
5		SGUD11−00A	Ornament Plate	(1)
6		SDUD2−2	Filter	(1)
7	○	SBCD30−1SA	Memory Button	(1)
7	Ⓚ	SBCD30−00A	Memory Button	(1)
8	○	SBCD20−1SA	Play Button	(1)
8	Ⓚ	SBCD20−00A	Play Button	(1)
10 [XA, PA, PE, PC]		SGPD10−10A	Chassis	(1)
10 [Other areas]		SGPD10−00A	Chassis	(1)
11		SRGA008N01	Foot	(4)
12 [XL]		SJVD0204A	Holder	(1)
12 [Other areas]		SJVD0203A	Holder	(1)
13		SJFD1	Holder	(1)
14 [MC]		SGTD30	Name Plate	(1)
14 [E]		SGTD11	Name Plate	(1)
14 [EK]		SGTD12	Name Plate	(1)
14 [XL]		SGTD13	Name Plate	(1)
14 [EG]		SGTD29	Name Plate	(1)
14 [PA, PE, PC]		SGTD18	Name Plate	(1)
14 [EB, EH, EF, EI]		SGTD28	Name Plate	(1)
15		SHE185	Spacer	(3)
16		SRQSJ02N01	Ground Spring	(1)
17		SRDJ007N05	Output Jack (R)	(1)
18		SRDJ007N06	Output Jack (L)	(1)
19		SJS6805	Subcode Jack	(1)
20		SHGD25	Cushion Rubber	(1)
21		SMCD2−1	Shield Plate	(1)
22	⚠	SJVD0203B	AC Socket	(1)
TRAVERSE DECK PARTS				
31		SIRD1−1	Case	(1)
32	○	SGXD9E−2	Ornament Plate	(1)
32	Ⓚ	SGXD9E−1	Ornament Plate	(1)
32-1		SGBD2−1	Badge	(1)
33		SUSD10	Spring	(1)
34		SIRD3	Lever	(1)
35		SIWD3E	Tray Ass'y	(1)
35-1		SHGD7−1	Rubber	(3)
35-2		SIRD4	Spacer	(4)
35-3		SHGD19	Rubber	(1)
36		SISD3	Drive Rack	(1)
37		SRGB007N02	Belt	(1)
38		SDGD10	Gear	(1)
39		SDGD11	Gear	(1)
40		SDGD12	Gear	(1)
41		SHGD5	Rubber	(2)
42		SISD2E	Bracket	(1)

Ref. No.		Part No.	Description	
TRAVERSE DECK PARTS				
43		SJGD2R	Motor Ass'y	(1)
44		SISD1	Loading Base	(1)
45		SHGD11	Rubber	(1)
46		SHGD24	Rubber	(1)
47		SHGD20	Rubber	(1)
48		SUSD16	Spring	(1)
49		SIRD5	Disc Clamper	(1)
50		SIRD6	Holder	(1)
51		SOMD4	Magnet	(1)
52		SOYD2	Yoke	(1)
53		SHGD8	Rubber	(1)
54		SUSD11	Spring	(1)
55		SIRD2	Lever	(1)
56		SUSD9	Spring	(1)
57		SDMD2A	Rotor Ass'y	(1)
58		SUXD15	Shaft	(2)
59		SHGD10	Rubber	(2)
60		EWSL03	Holder	(1)
61		SISD4E	Traverse Base	(1)
62	⚠	SOAD20A	Optical Pick-up Ass'y	(1)
63		SORD7	Cover	(1)
64		SORD5E	Coil	(1)
65		SOYD3E	Yoke (A)	(2)
66		SOYD4	Yoke (B)	(2)
67		SDGD13	Gear	(1)
68		EWS7AJ	Resistance Unit	(1)
69		SHRD4	Lock Unit	(1)
70		SDOD8	Ring	(1)
71		SRQA010N04	Spring	(1)
72		SDOD7−1	Turntable Ass'y	(1)
73		SHRD3	Holder	(3)
74		SUSD12	Spring (A)	(2)
75		SHGD9	Rubber	(3)
76		SUSD13	Spring (B)	(1)
77		SXPD220−1	Spindle P.C.B. Ass'y	(1)
78		SRDJ001N14E	Connector Ass'y	(1)
79		SHGD6	Rubber	(2)
CONNECTORS				
81		EMCS0250ZL	Connector (White), CN103	(1)
81		EMCS0250ZLB	Connector (Blue), CN101	(1)
81		EMCS0250ZLR	Connector (Red), CN102	(1)
82		EMCS0350Z	Connector (White), CN104	(1)
82		EMCS0550Z	Connector (White), CN202	(1)
82		EMCS0650Z	Connector (White), CN701	(1)
82		EMCS0950Z	Connector (White), CN11	(1)
82		EMCS0950ZMB	Connector (Blue), CN201	(1)
82		EMCS0950ZMR	Connector (Red), CN203	(1)
83		SJSD0905	Connector, CN401~404	(4)
84		SJS1703	Connector, CN106	(1)
85		EMCS0551ML	Connector, CN105	(1)
SCREWS and WASHERS				
N1		XTV3+8G	Screw, ⊕3×8	(13)
N2		XTV3+6JFYR	Screw, ⊕3×6	(2)
N3		XTV3+14JFYR	Screw, ⊕3×14	(3)
N4	○	SRXG007N10	Screw	(4)
N4	Ⓚ	SRXG007N51	Screw	(4)

Ref. No.		Part No.	Description	
SCREWS and WASHERS				
N5		XTV3+8JFZ	Screw, ⊕3×8	(3)
N6		XTW3+8T	Screw, ⊕3×8	(7)
N7		SFXGB20−01	Screw	(2)
N8		SRXW007N02	Washer	(1)
N9		XYN26+C4	Screw, ⊕2.6×4	(2)
N10		XTV3+10G	Screw, ⊕3×10	(3)
N11		XTV3+6J	Screw, ⊕3×6	(1)
N12		SFXGQ06N01	Screw	(2)
N13		XYN26+W8	Screw, ⊕2.6×8	(2)
N14		XXE26D5	Screw	(1)
N15		SRXG007N11	Screw	(1)
N16		XYE3+EJ8	Screw, ⊕3×8	(1)
N17		SNSD3	Screw	(1)
N18		XTN3+40JFYR	Screw, ⊕3×40	(1)
N19		XWE3D8	Washer	(1)
N20		XTV3+8GFZ	Screw, ⊕3×8	(1)
PACKING PARTS				
P1 [MC, EF]	○	SPND40	Carton Box	(1)
P1 [Other areas]	○	SPND39	Carton Box	(1)
P1 [MC, EF]	Ⓚ	SPND13	Carton Box	(1)
P1 [Other areas]	Ⓚ	SPND12	Carton Box	(1)
P2		SPSD26	Pad, Front	(1)
P3		SPSD27	Pad, Rear	(1)
P4		SPSD32	Spacer	(1)
P5		XZB55X40A01	Polyethylene Bag, Unit	(1)
P6		SFYF23A35	Polyethylene Bag, Accessories	(1)
ACCESSORIES				
A1 [M]		SQUD17	Instruction Book	(1)
A1 [MC]		SQUD18E	Instruction Book	(1)
A1 [XL, XA, EG, EF]		SQUD19	Instruction Book	(1)
A1 [EK]		SQUD20	Instruction Book	(1)
A1 [EI]		SQUD21	Instruction Book	(1)
A1 [PA, PE, PC]		SQUD22E	Instruction Book	(1)
A1 [Other areas]		SQUD23E	Instruction Book	(1)
A2 [M, MC]	⚠	SJA170	AC Cord	(1)
A2 [XL]	⚠	SJA173	AC Cord	(1)
A2 [EK]	⚠	SFDAC05G02	AC Cord	(1)
A2 [XA, PA, PC, PE]	⚠	SJA168−1	AC Cord	(1)
A2 [Other areas]	⚠	SJA171	AC Cord	(1)
A3		SRDH001N01	Output Cord	(1)
A4 [XA, PA, PC, PE only]	⚠	SJP9215	Adaptor	(1)

■ RESISTORS AND CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The " S " mark is service standard parts and may differ from production parts.
4. Unless otherwise specified.
All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ.
All capacitors are in MICORFARADS (μF), P = 10^{-6}μF.

Numbering System of Resistor

Example

ERD	S2	T	J	101
Type	Wattage (1/4W)	Shap	Tolerance (± 5%)	Value (1kΩ)

ERJ	8	GEY	J	102	[ ]
Type	Wattage (1/8W)	Shape	Tolerance (± 5%)	Value (1kΩ)	Specialuse

Resistor Type	Wattage	Tolerance
ERD : Carbon ERJ : Chip Type Carbon ERO : Metal Film	S2 : 1/4W 8 : 1/8W	J : ± 5% K : ± 10%

Numbering System of Capacitor

Example

ECKD	1H	102	K	C
Type	Voltage (50V)	Value (0.001μF)	Tolerance (± 10%)	Peculiarity

ECEA	0G	KS	470	L
Type	Voltage (4V DC)	Peculiarity use	Value (47μF)	Special use

GR426	B	273	K	25
Type	Peculiarity	Value (0.027μF)	Tolerance (± 10%)	Voltage (25V)

Type	Voltage	Tolerance
ECEA, AR, REC : Electrolytic	**ECEA, AR, REC, ECEV Types** 0G : 4V 0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1V : 35V 1H : 50V	F : ± 1 pF J : ± 5% K : ± 10% M : ± 20% Z : $^{+80}_{-20}$% N : ± 30% P : $^{+100}_{0}$%
ECEA....N, ARA.....N : Non-Polar Electrolytic		
ECEV...N : Non-Polar Electrolytic (Chip Type)		
ECQV : TF ECQM : Polyester	**Others** 1E : 25V DC 1H : 50V DC 50 : 50V DC 2B : 125V DC KC : 125V AC	
ECFR, ECKD, ECFF, ECKR : Ceramic		
RCBS : Ceramic (Axial Type)		

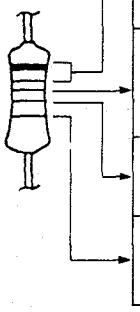
- **Indication of RCBS type capacitor (Axial type)**
- **Rated voltage**

The rated voltages are indicated by insulating paint colors.

Rated voltage (DC)	Paint color
16V	Pink
50V	Light-green

Electrostatic capacity and characteristics

The nominal electrostatic capacites (PF), tolerances and temperature characteristics are indicated by color codes.



Color band	Brown	Red	Orange	Yellow	Green	Blue	Purple	Gray	White	Black	Gold	Silver
1st, 2nd color bands (Effective number of nominal electrostatic capacity)	1	2	3	4	5	6	7	8	9	0	—	—
3rd color band (Multiplier of nominal electrostatic capacity)	10^1	10^2	10^3	10^4	—	—	—	—	—	10^0	10^{-1}	10^{-2}
4th color band (Tolerances)	—	—	—	—	—	—	—	N	Z	M	J	K
5th color band (Temperature characteristic)												

RESISTORS

Ref. No.	Part No.	Value
R11, 12	ERDS2TJ102	1K
R13	ERDS2TJ222	2.2K
R14	ERDS2TJ822	8.2K
R15	ERDS2TJ100	10
R101, 102	ERDS2TJ821	820
R103	ERDS2TJ154	150K
R104, 105	ERDS2TJ104	100K
R106	ERDS2TJ154	150K
R107	ERDS2TJ101	100
R108	ERDS2TJ474	470K
R109	ERDS2TJ222	2.2K
R110	ERDS2TJ564	560K
R111	ERDS2TJ472	4.7K
R112	ERDS2TJ683	68K
R113	ERDS2TJ104	100K
R114	ERDS2TJ474	470K
R115	ERDS2TJ101	100
R116	ERDS2TJ332	3.3K
R117	ERDS2TJ564	560K
R119	ERDS2TJ222	2.2K
R120	ERDS2TJ101	100
R121	ERDS2TJ392	3.9K
R122	ERDS2TJ270	27
R123	ERDS2TJ3R3	3.3
R124	ERDS2TJ224	220K
R125	ERDS2TJ333	33K

Ref. No.	Part No.	Value
R126	ERDS2TJ182	1.8K
R127	ERDS2TJ333	33K
R128	ERDS2TJ122	1.2K
R129	ERDS2TJ103	10K
R131	ERDS2TJ472	4.7K
R132	ERDS2TJ103	10K
R133	ERDS2TJ153	15K
R134	ERDS2TJ101	100
R135	ERDS2TJ270	27
R136	ERDS2TJ3R3	3.3
R137	ERDS2TJ272	2.7K
R138, 139	ERDS2TJ333	33K
R140	ERDS2TJ122	1.2K
R141	ERDS2TJ153	15K
R142	ERDS2TJ272	2.7K
R143	ERDS2TJ683	68K
R144	ERDS2TJ473	47K
R145	ERDS2TJ154	150K
R146, 147	ERDS2TJ222	2.2K
R148	ERDS2TJ223	22K
R149	ERDS2TJ334	330K
R150	ERDS2TJ822	8.2K
R151, 152	ERDS2TJ682	6.8K
R153	ERDS2TJ822	8.2K
R154, 155	ERDS2TJ222	2.2K
R156, 157	ERDS2TJ102	1K

Ref. No.	Part No.	Value
R158	ERDS2TJ471	470
R159	ERDS2TJ120	12
R160	ERDS2TJ153	15K
R161	ERDS2TJ272	2.7K
R162	ERDS2TJ102	1K
R163	ERDS2TJ104	100K
R201	ERDS2TJ223	22K
R202	ERDS2TJ473	47K
R203	ERDS2TJ223	22K
R204~208	ERDS2TJ473	47K
R209	ERDS2TJ682	6.8K
R210	ERDS2TJ224	220K
R211	ERDS2TJ223	22K
R212	ERDS2TJ101	100
R213	ERDS2TJ392	3.9K
R214	ERDS2TJ101	100
R215	ERDS2TJ392	3.9K
R216, 217	ERDS2TJ222	2.2K
R218	ERDS2TJ473	47K
R301	ERDS2TJ224	220K
R302	ERDS2TJ333	33K
R303	ERDS2TJ221	220
R304	ERDS2TJ562	5.6K
R305	ERDS2TJ474	470K
R401~407	ERDS2TJ472	4.7K
R408~413	ERDS2TJ103	10K

Ref. No.	Part No.	Value
R414	ERDS2TJ105	1M
R415	ERDS2TJ472	4.7K
R501	ERJ8GEYJ1R5V	1.5
R502	ERJ8GEYJ223V	22K
R503, 504	ERJ8GEYJ560V	56
R505	ERJ8GEYJ473V	47K
R701	ERDS2TJ154	150K
R702	ERDS2TJ224	220K
R703, 704	ERDS2TJ102	1K
R705	ERDS2TJ123	12K
R706	ERDS2TJ103	10K
R707	ERDS2TJ472	4.7K
R708	ERDS2TJ561	560
R709	ERDS2TJ102	1K
R710	ERDS2TJ152	1.5K
R801, 802	ERDS2TJ222	2.2K
R803	EROS2CKG1101	1.1K
R804	EROS2TKG1101	1.1K
R805, 806	EROS2TKG1201	1.2K
R807	ERDS2TJ391	390
R808	ERDS2TJ104	100K
R809	ERDS2TJ391	390
R810	ERDS2TJ104	100K

CAPACITORS

Ref. No.	Part No.	Value
C1 ⚠	ECKDKC103PF	0.01
C4, 5	ECEA1EU102	1000
C6, 7	ECEA1VU470	47
C11, 12	ECEA1CU222	2200
C13, 14	ECEA0JU221	220
C15	ECEA1EU470	47
C18	ECEA1HU470	47
C101, 102	ECEA1CKS100	10
C103	RCBS1C103MYY	0.01
C104	ECQM1H104KV	0.1
C105	RCBS1H221KBY	220P
C106	ECEA1HSN010	1
C108	ECEA1HSN2R2	2.2
C109	ECEA1HSN0R1	0.1
C110	ECQM1H123KV	0.012
C111	ECQM1H152KV	0.0015
C112	ECQM1H223KV	0.022
C114	ECEA1HSN010	1
C115	ECEA1HSNR22	0.22
C116	ECQM1H123KV	0.012
C117	RCBS1H681KBY	680P
C118	ECQM1H103KV	0.01
C119	RCBS1C103MYY	0.01
C120, 121	RCBS1H102KBY	0.001

Ref. No.	Part No.	Value
C122	RCBS1H681KBY	680P
C123, 124	RCBS1H102KBY	0.001
C125	ECEA1HKS0R1	0.1
C126	RCBS1H220JLY	22P
C127	ECEA1HKS010	1
C128	ECFR1H104ZFM	0.1
C129, 130	ECEA1CKS100	10
C133	RCBS1H681KBY	680P
C134	ECEA0JKS220	22
C135	ECEA1HKS010	1
C136	RCBS1H221KBY	220P
C137	ECQM1H333KV	0.033
C138	RCBS1H682MXY	0.0068
C139	RCBS1H182MXY	0.0018
C140	ECEA1HKSR33	0.33
C141	ECEA0JKS470	47
C142, 143	ECEA0JKS220	22
C144	RCBS1C103MYY	0,01
C145	ECEA0JKS220	22
C146	ECQV1H104JZ	0.1
C147	RCBS1C103MYY	0.01
C148	ECKR1H102KB	0.001
C201, 202	ECQM1H104JV	0.01
C301	RCBS1H150JCY	15P

Ref. No.	Part No.	Value
C302	ECEA1VKN2R2	2.2
C303	ECQM1H153KV	0.015
C304	ECQM1H154KV	0.15
C305	ECQM1H104KV	0.1
C306	RCBS1H102KBY	0.001
C307	ECEA1HUR47	0.47
C308	ECQM1H333KV	0.033
C309	RCBS1H102KBY	0.001
C310	ECQM1H104KV	0.1
C312	RCBS1H220JCY	22P
C313	RCBS1H6R8KCY	6.8P
C314	ECQV1H104JZ	0.1
C315	RCBS1C103MYY	0.01
C317~319	RCBS1C103MYY	0.01
C320	ECQV1H104JZ	0.1
C321, 322	RCBS1H681KBY	680P
C401	ECEA0JU470	47
C402	ECFR1H104ZFM	0.1
C403	ECKR1H102KB	0.001
C404	ECKR1H103ZF	0.01
C501	ECEV1EV6R8R	6.8
C502	GR426B273K25	0.027
C503, 504	ECEVICN4R7R	4.7
C505	GR426B104M25	0.1

Ref. No.	Part No.	Value
C506	GR426F334Z25	0.33
C507	GR426F224Z25	0.22
C508, 509	GR426F104Z25	0.1
C510	GR426F104Z25	0.1
C701	ECQM1H333KV	0.033
C702	ECFR1H104ZFM	0.1
C703	ECEA0JU470	47
C801	ECEA1CU470	47
C802	ECEA0JU470	47
C803	ECEA1CU470	47
C804	ECEA0JU470	47
C805, 806	ECKR1H391KB	390P
C807, 808	ECQM1H103JV	0.01
C809, 810	ECEA1CN220S	22
C811, 812	ECKR1H102KB	0.001
C813	ECKR1H103ZF	0.01
C814, 815	ECKR1H102KB	0.001
C816	ECEA1CU470	47
C817	ECEA1EU331	330

■ TERMINAL FUNCTION OF LSI

• MN6617 (Digital Signal Processing : EFM Decoder, Error Correction, CLV Servo)

Pin No.	Mark	I/O Devision	Function
1	BLKCK	O	Sub-code block (Q data) clock (75 Hz)
2	$\overline{\text{CLDCK}}$	O	Sub-code frame (Q data) clock (7.35 kHz)
3	$\overline{\text{SUBQ}}$	O	Sub-code (Q data) output
4	CRC	O	Sub-code (Q data) CRC check (Not used, open)
5	$\overline{\text{RST}}$	I	Reset signal input (reset at "L")
6	MLD	I	Command load input
7	MCLK	I	Command clock input
8	MDATA	I	Command data input
9	DMUTE	I	Muting control (muting ON at "H")
10	$\overline{\text{TRON}}$	I	Tracking servo ON signal (tracking servo ON at "L")
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output
12	SMCK	O	Clock output (4.2336 MHz)
13	PMCK	O	Pitch control clock output (Not used, open)
14	ITC	I	Track counter input signal (Not used, connected to +5V)
15	$\overline{\text{TEST}}$	I	Test mode selection (Not used, connected to +5V)
16	X2	O	Clock output (16.9334 MHz)
17	X1	I	Clock input (16.9344 MHz)
18	SEL	I	DA output parallel/serial selection (serial at "L")
19	LDG/WDCK	O	L channel deglitch signal/serial data word clock.
20	RDG	O	R channel deglitch signal.
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
22	IPFLAG	O	Interpolation flag (interpolation at "H")
23	FLAG0	O	Error flag (error at "H")
24	FLAG6	O	16 K RAM address reset signal (reset at "H")
25	XCK	O	Clock (16.9334 MHz) output (Not used, open)
26	DA15/ SRDATA	O	16-bit data output/serial data output (MSB first)
27	DA14/ SRDATAX	O	16-bit data output/serial data output (LSB first)
28	DA13/SRCK	O	16-bit data output/serial data beat clock.
29	DA12/WDCK	O	16-bit data output/serial data word clock (Not used)
30	DA11/ BYTCK	O	16-bit data output/serial data byte clock (Not used)
31	GND	I	GND terminal
32	DA10/RIL	O	16-bit data output/RIL signal
33	DA9/RESY	O	16-bit data output/ Resynchronizing signal

Pin No.	Mark	I/O Devision	Function
34	DA8/FCLV	O	16-bit data output/Synchronizing detection signal (Not used)
35	DA7/ IPBYTE	O	16-bit data output/Interpolation flag for each byte (Not used)
36	DA6/IPSEL	I/O	16-bit data output/ interpolation inhibit (Not used)
37	DA5/FLAG5	O	16-bit data output/C2 decoder correction flag 3 (Not used)
38	DA4/FLAG4	O	16-bit data output/C2 decoder correction flag 2 (Not used)
39	DA3/FLAG3	O	16-bit data output/C2 decoder correction flag 1 (Not used)
40	DA2/FLAG2	O	16-bit data output/C1 decoder correction flag 2 (Not used)
41	DA1/FLAG1	O	16-bit data output/C1 decoder correction flag 1 (Not used)
42	DA0/FLCK0	O	16-bit data output/Crystal frame clock
43 ∫ 50	D7 ∫ D0	I/O	16 K RAM data output
51	RAMOE	O	16 K RAM $\overline{\text{OE}}$ signal
52	RAMWE	O	16 K RAM $\overline{\text{WE}}$ signal
53 ∫ 63	RAMA 0 ∫ RAMA10	O	16 K RAM address signal (RAMA0 : LSB, RAMA10: MSB)
64	PC	O	Spindle motor ON signal (ON at "L")
65	EC	O	Spindle motor drive signal
66	FG	I	Spindle motor FG signal input
67	——	——	——
68	——	——	——
69	——	——	——
70	——	——	——
71	——	——	——
72	PCK	I	PLL extract clock input (4.3218 MHz)
73	VDD	I	Power supply (connected to +5V)
74	EFM	I	EFM signal input (PLL)
75	SRF	I	EFM signal input (DSL)
76	DO	I	Drop-out signal (Drop-out at "H")
77	CLVS	O	11T stereo OK signal (OK at "H")
78	FPC	O	PLL frequency comparision signal
79	BSSEL	O	PLL frequency in take operation signal.
80	——	——	——
81	——	——	——
82	——	——	——
83	SUBC	O	Sub-code serial output data
84	SBCK	I	Clock for sub-code serial output

• MN6618 (Digital Filter)

Pin No.	Mark	I/O Device	Function
1	———	——	———
2	D012	O	16-bit parallel deta output
3	D011/SCK	O	16-bit parallel data output/ serial output bit clock
4	D010/SOUT	O	16-bit parallel data output/ serial output data
5	GND	I	GND terminal
6	D09	O	16-bit parallel data
7	———	——	———
8	D08	O	16-bit parallel data
9	D07	O	16-bit parallel data
10	———	——	———
11	———	——	———
12	D06	O	16-bit parallel data
13	D05	O	16-bit parallel data
14	D04	O	16-bit parallel data
15	D03/2RLCK	O	16-bit parallel data/RL signal
16	———	——	———
17	———	——	———
18	D02/WCK	O	16-bit parallel data/serial output word clock
19	D01	O	16-bit parallel data
20	D00	O	16-bit parallel data (LSB)
21	MDATA	I	Command data input

Pin No.	Mark	I/O Device	Function
22	———	——	———
23	MCLK	I	Command clock input
24	MLD	I	Command load input
25	———	——	———
26	$\overline{RST}$	I	Reset signal input (reset at "L")
27	VDD	I	Power supply (connected to +5V)
28	LRCK	I	R/L signal
29	———	——	———
30	SFT	I	Serial data input clock
31	SIN	I	Serial data input
32	———	——	———
33	X OUT	O	Clock output (Not used)
34	X IN	I	Clock input (16.9344 MHz)
35	OSEL	I	DA output parallel/serial selection. (parallel at "H")
36	LDGL	O	L channel deglitch signal
37	RDGL	O	R channel deglitch signal
38	VDD	I	Power supply (connected to +5V)
39	D015	O	16-bit parallel data (MSB)
40	D014	O	16-bit parallel data
41	———	——	———
42	D013	O	16-bit parallel data

• AN8371S (Data Slice and PLL)

Pin No.	Mark	I/O Devision	Function
1	VEE	I	Power supply (connected to –5V)
2	SRF	O	RF signal output data-sliced into digital value
3	EFM	O	EFM signal output synchronized with PCK
4	D·GND	I	GND terminal (digital system)
5	PCK	O	Clock output extracted from SRF
6	VCC	I	Power supply (connected to +5V)
7	VA	I	VCO free ran frequency adjusting current input
8	VC1	I	Capacitor connection for VCO oscillation frequency
9	VC2	I	Capacitor connection for VCO oscillation frequency
10	VR	I	Resistor connection for VCO oscillation frequency
11	PD	I	Capacitor connection for PLL DO protection

Pin No.	Mark	I/O Devision	Function
12	PL1	I	PLL loop filter constant connection
13	PL2	I	PLL loop filter constant connection
14	FPC	I	Frequency comparison error signal input.
15	RF	I	RF signal input
16	ARF	O	RF signal output with AGC applied
17	AGC	I	ARF signal input for AGF drop-out detection
18	AC	I	AGC loop filter constant connection
19	DO	O	Drop-out detection pulse output
20	A·GND	I	GND terminal (analog system)
21	DSL	I	RF signal input for data slicer
22	SLC	I	Slice level control signal input
23	FC1	I	Data slicer filter capacitor connection
24	FC2	I	Data slicer filter capacitor connection

• AN8370S (Optical Servo Control)

Pin No.	Mark	I/O Devision	Function
1	VEE	I	Power supply (connected to −5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE−	I	Phase difference-voltage conversion (−)
9	TE +	I	Phase difference-voltage conversion (+)
10	APC −	O	Laser power inversion input
11	C·MEM	I	Capacitor connection for phase difference memory
12	APC +	I	Laser power non-inversion input
13	VREF	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Track-cross speed control output (not used, grounded)
18	C·MSP	I	Track-cross reference speed setting capacitor connection (not used, grounded)
19	C·AF	I	Auto focus timer capacitor connection
20	KICK R/$\overline{F}$	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input ($\overline{FOON}$: Focus servo ON signal)

Pin No	Mark	I/O Devision	Function
23	CNT2	I	Control input ($\overline{TRON}$: Tracking servo ON signal)
24	CNT3	I	Control input (KICKF : Kick direction [forward] command)
25	CNT4	I	Control input (KICKR : Kick direction [reverse] command)
26	$\overline{F·LOCK}$	O	Focus lock signal output
27	C·FBDO	O	Capacitor connection for inversion RF high speed detection
28	C·SBDO	O	Capacitor connection for inversion RF low speed detection
29	C·SBRT	O	Capacitor connection for non-inversion RF low speed detection
30	C · FBRT	O	Capacitor connection for non-inversion RF high speed detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RFIN	I	RF signal input
34	S·OUT	O	Focus search signal output
35	C·LW	I	Capacitor connection for triangular wave generation
36	FE·OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE·REF	I	Focus error comparison voltage generation
39	PDB	I	Photo detector current input (B)
40	IVB	O	Current/voltage conversion output (B)
41	IVA	O	Current/voltage conversion output (A)
42	PDA	I	Photo detector current input (A)

• AN8280LF (Spindle Motor Drive)

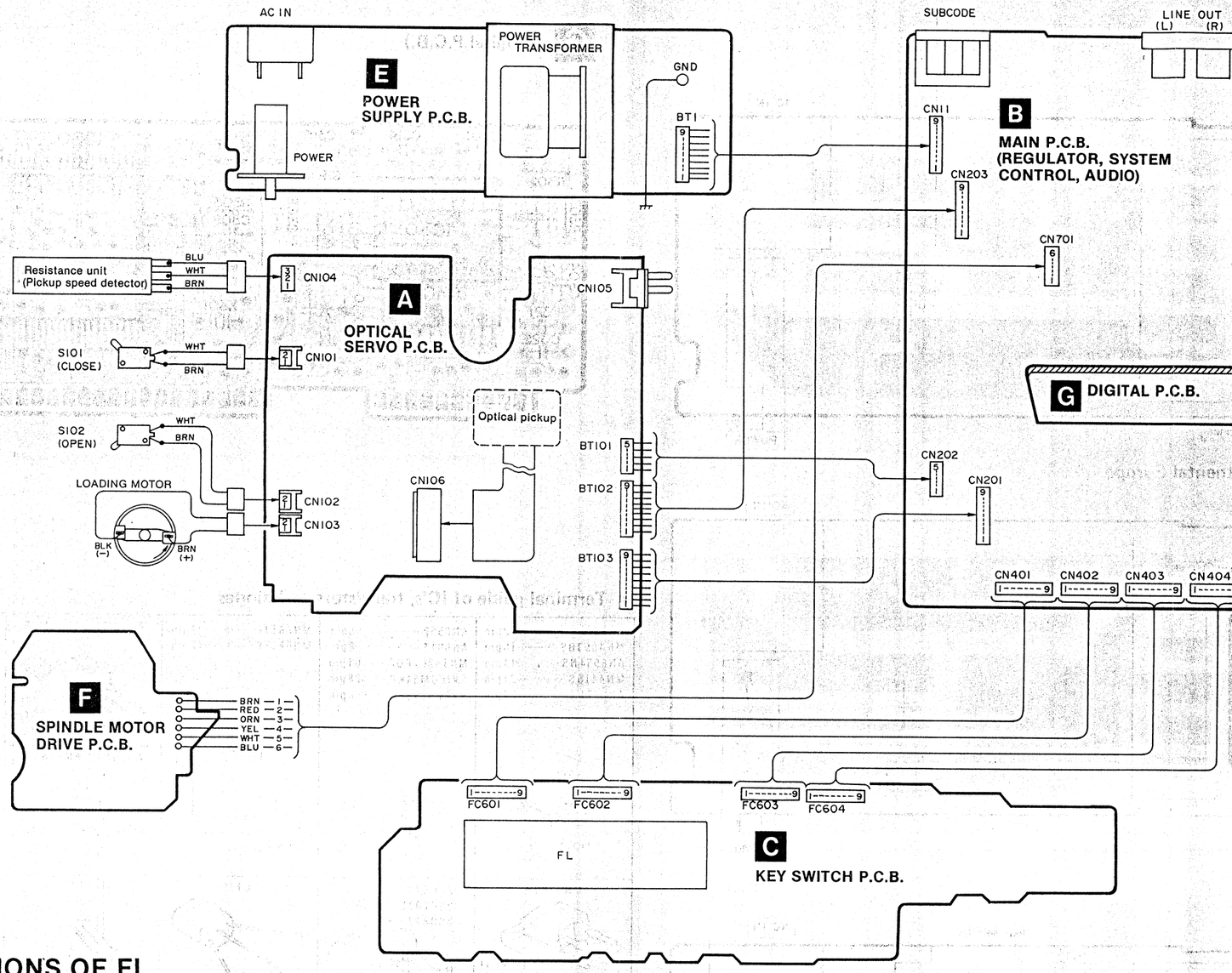
Pin No.	Mark	I/O Device	Function
1	FGP	O	FG pulse output
2	VCC	I	Power supply
3	PC	I	Motor drive command input and capacitor connection for phase compesation
4	SC	O	Current detection
5	B1	O	Spindle motor drive signal output
6	B2		
7	A2		
8	A1		

Pin No.	Mark	I/O Device	Function
9	HB	O	Hall element bias voltage output
10	DCR	I	Reference voltage input
11	FAO	O	Loop filter amplifier constant connection
12	FIA	I	Spindle motor control and loop filter amplifier constant connection
13	H2−	I	Hall element's Hall voltage input (inversion)
14	H2+	I	Hall element's Hall voltage input (non-inversion)
15	HI−	I	Hall element's Hall voltage input (inversion)
16	HI+	I	Hall element's Hall voltage input (non-inversion)

• MN15261PDC1 (System Control and FL Drive)

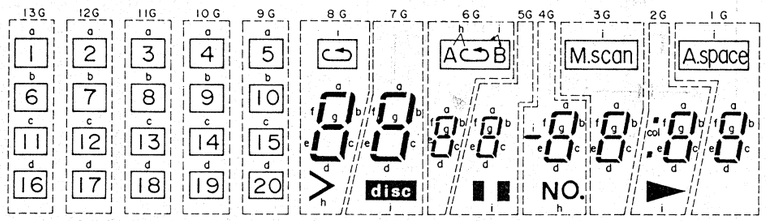
Pin No.	Mark	Signal	I/O Device	Function
1	VSS	GND	I	GND terminal
2	X0	———	O	Not used (Open)
3	XI	———	I	Not used (Open)
4	P00	$\overline{\text{TTON}}$	O	Spindle motor control signal (ON · OFF command)
5	P01	M DATA	O	Command data output
6	P02	MCLK	O	Command clock output
7	P03	MLD	O	Command load output
8	P10	M-RELAY	O	Muting relay control
9	P11	D-MUTE	O	Muting control
10	P12	$\overline{\text{SYNC REC}}$	O	Synchro recording control (Not used)
11	P13	$\overline{\text{SYNC SRT}}$	O	Direct operation control (Not used)
12	$\overline{\text{SYNC}}$	———	O	Not used (Open)
13	$\overline{\text{RST}}$	RESET	I	Reset signal input (reset at "L")
14	$\overline{\text{IRQ}}$	BLOCK	I	Sub-code block (Q data) clock (75 Hz) input
15 ≀ 18	P50 ≀ P53	———	I	Key scan input
19	$\overline{\text{SBT}}$	$\overline{\text{CLDCK}}$	I	Sub-code frame clock (7.35 kHz)
20	$\overline{\text{SBD}}$	SUBQ	I	Sub-code Q data input
21	P20	SEEK	O	Rough search ON · OFF signal
22	P21	$\overline{\text{TRAV}}$	O	Traverse servo control signal
23	P22	$\overline{\text{REV}}$	O	Traverse reverse command signal
24	P23	$\overline{\text{FWD}}$	O	Traverse forward command signal
25	P30	CNT4	O	Optical servo IC control signal (KICKR : Kick direction [Reverse] command)
26	P31	CNT3	O	Optical servo IC control signal (KICKF : Kick direction [Forward] command)
27	P32	CNT2	O	Optical servo IC control signal ($\overline{\text{TRON}}$: Tracking servo)
28	P33	CNT1	O	Optical servo IC control signal ($\overline{\text{FOON}}$: Focus servo)
29	P40	STAT	I	Key input strobe and processing status input from signal processing LSI traverse position detection.
30	P41	$\overline{\text{COMP}}$	I	Traverse position input
31	P42	$\overline{\text{FLOCK}}$	I	Optical servo condition (focus) input
32	P43	$\overline{\text{SENSE}}$	I	Optical servo condition (track cross) input
33	PE0	$\overline{\text{CLOSE}}$	O	Loading motor close command (ON at "L")
34	PE1	$\overline{\text{OPEN}}$	O	Loading motor open command (ON at "L")
35	P60	FFRST	O	Not used (Open)
36	P61	———	O	———
37	DAC	DAC DATA	O	Traverse drive output
38	VPP	———	I	FL drive power supply (connected to −34V)
39 ≀ 52	D0 ≀ DD	———	O	FL grid signal and key scan signal
53 ≀ 61	S8 ≀ S0	———	O	FL anode signal
62	OSC 2	———	I	Not used (Open)
63	OSC 1	———	I	Clock input
64	VDD	———	I	Power supply (connected to +5V)

■ PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



■ INTERNAL CONNECTIONS OF FL

- Grid connection diagram



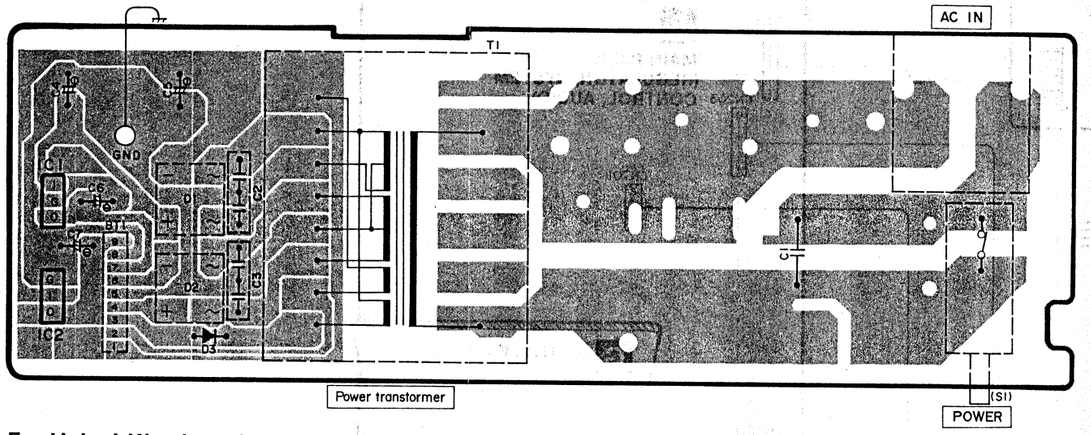
- Anode connection table

Pin NO.	4 (13G)	6 (12G)	8 (11G)	10 (10G)	12 (9G)	14 (8G)	16 (7G)	18 (6G)	20 (5G)	22 (4G)	24 (3G)	26 (2G)	28 (1G)
5(a)	1	2	3	4	5	a	a	a	a	a	a	a	a
7(b)	6	7	8	9	10	b	b	b	b	b	b	b	b
9(c)	11	12	13	14	15	c	c	c	c	c	c	c	c
11(d)	16	17	18	19	20	d	d	d	d	d	d	d	d
19(e)	—	—	—	—	—	e	e	e	e	e	e	e	e
21(f)	—	—	—	—	—	f	f	f	f	f	f	f	f
23(g)	—	—	—	—	—	g	g	g	g	g	g	g	g
25(h)	—	—	—	—	—	>	—	A ⊃	—	NO.	—	col	—
27(i)	—	—	—	—	—	⊃	disc	B	▮▮	—	M.scan	▶	A.space

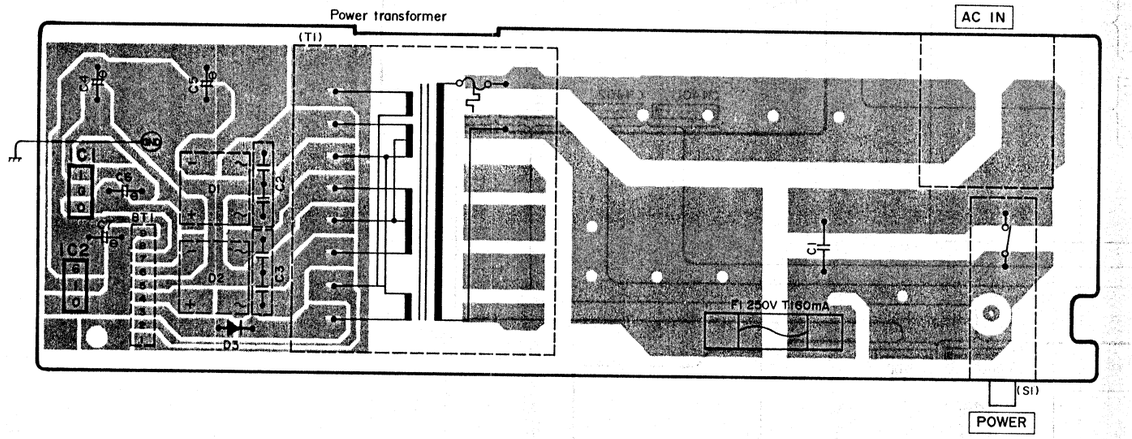
■ PRINTED CIRCUIT BOARDS

E (Power supply P.C.B.)

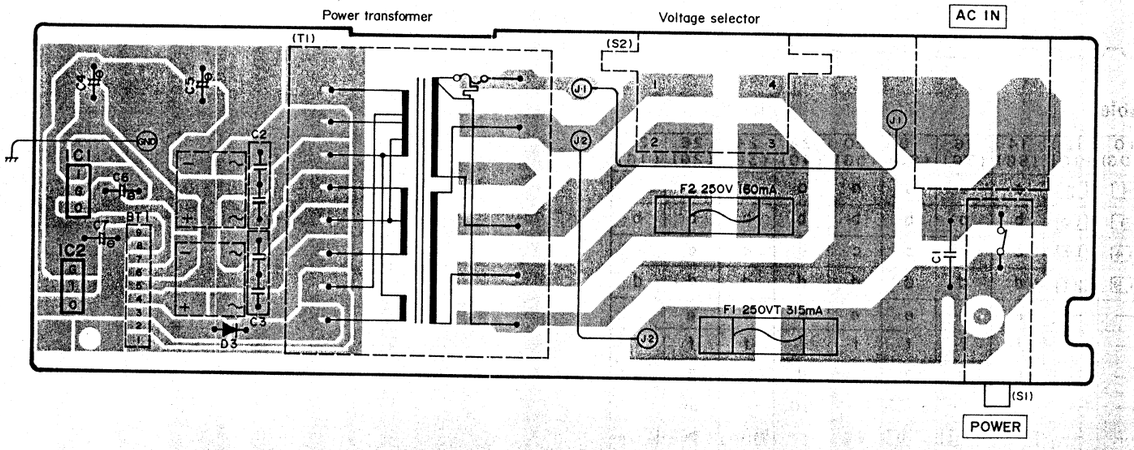
- For U.S.A. and Canada



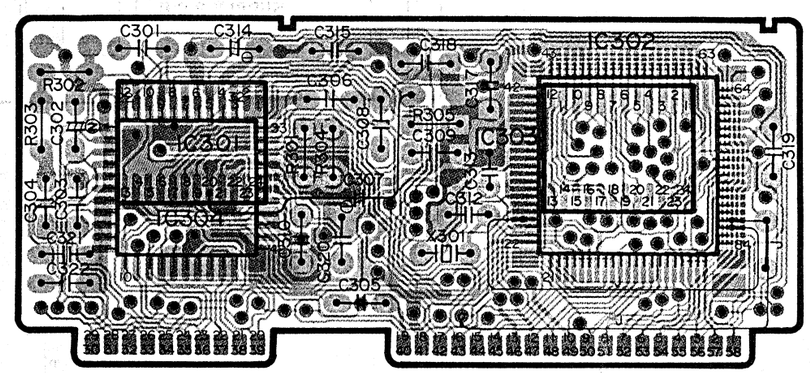
- For United Kingdom, Australia and Contnental Europe



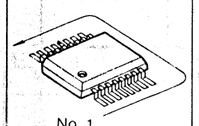
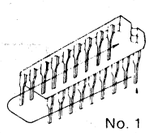
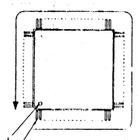
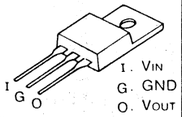
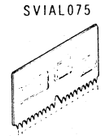
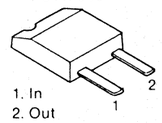
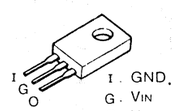
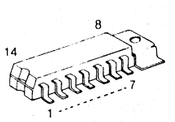
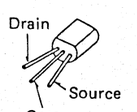
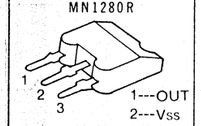
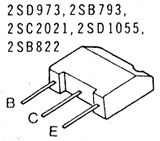
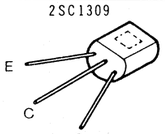
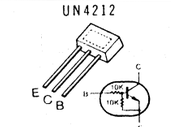
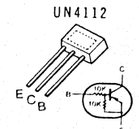
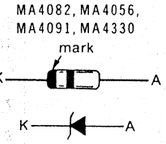
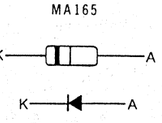
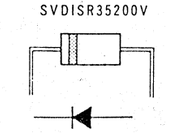
- For Others



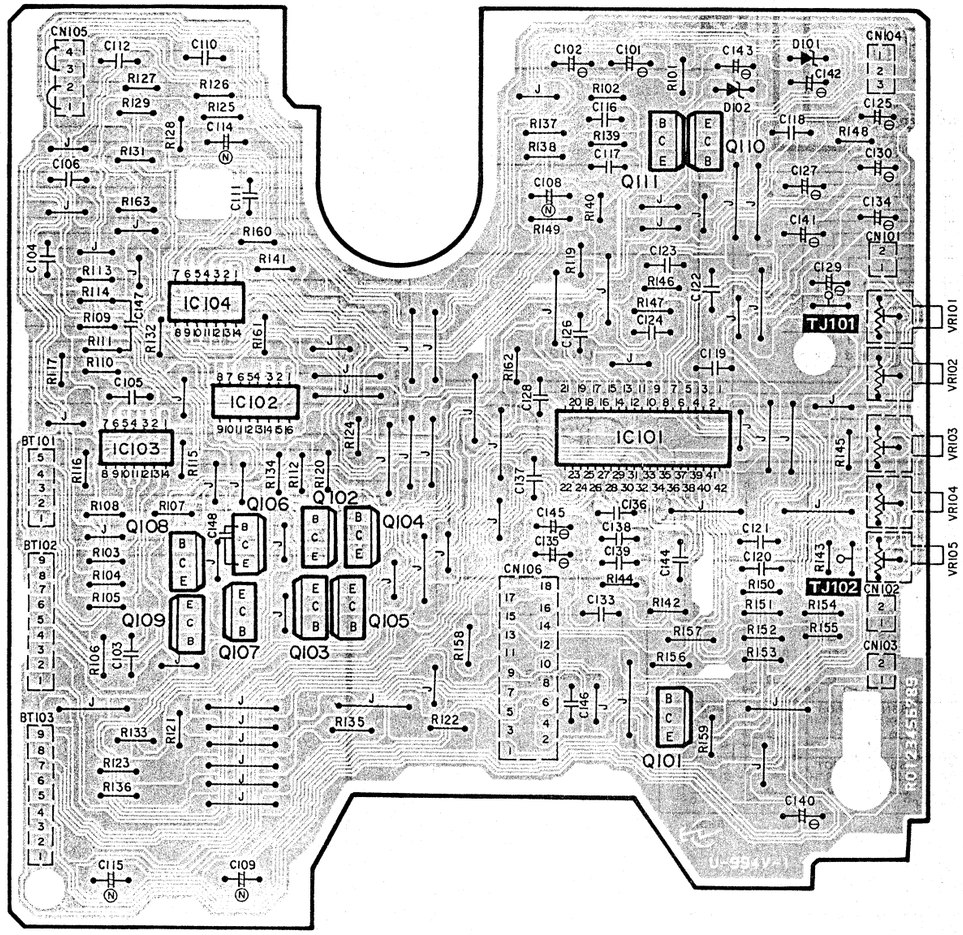
G (Digital P.C.B.)



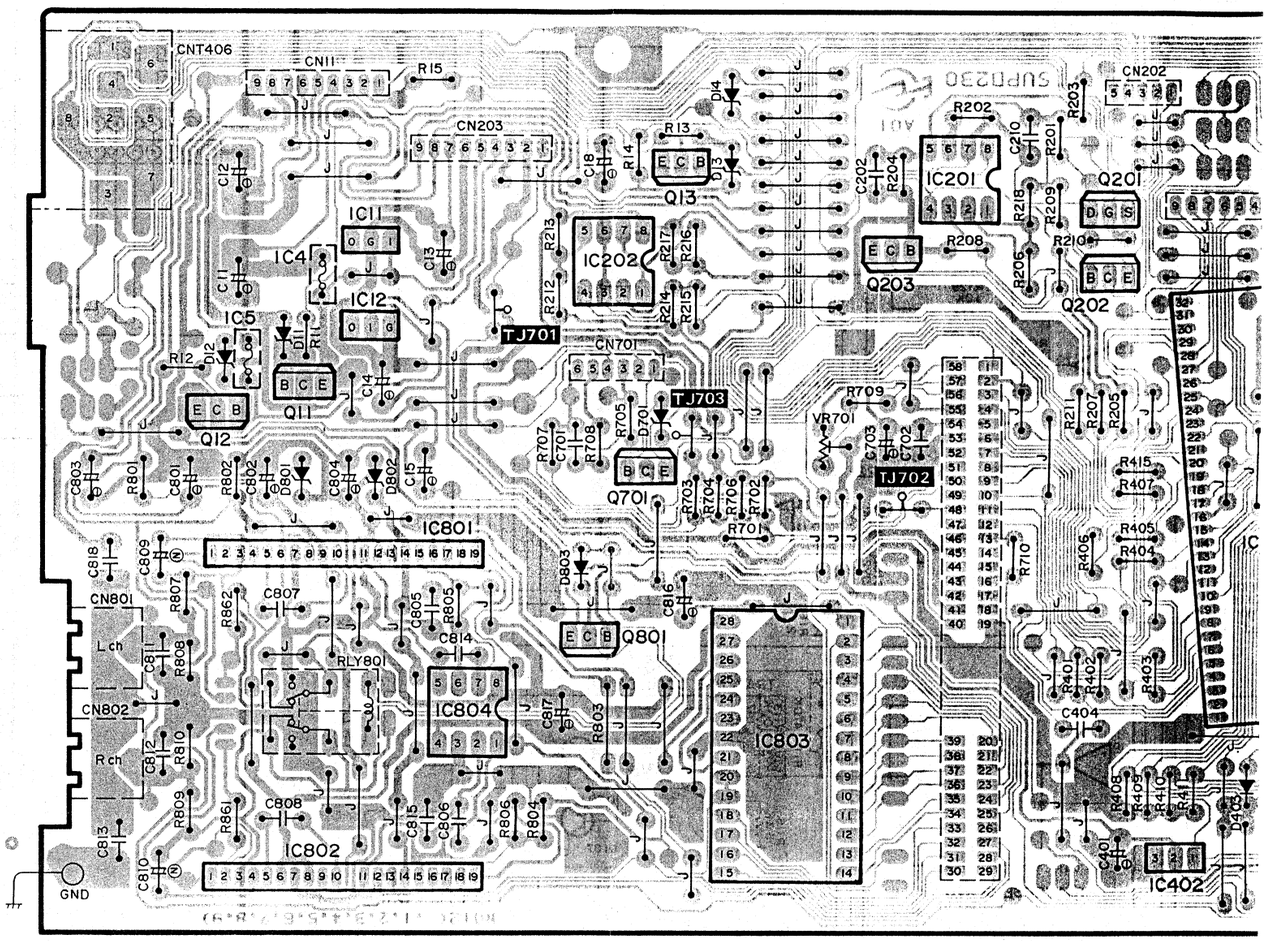
- Terminal guide of IC's, transistors and diodes

AN8370S ····· 42pin MN4053BS ····· 16pin AN6554NS ····· 14pin MN4416S ····· 24pin AN8371S ····· 24pin  No. 1	AN6552 ····· 8pin AN6914 ····· 8pin MN15261PDC ····· 64pin SVIPCM54KP ····· 28pin SVIM5238PA ····· 8pin  No. 1	MN6617F ····· 84pin MN6618F ····· 42pin  Mark No. 1	AN78M12, AN78M05  I. VIN G. GND O. VOUT	SVIAL075 	SVIFU15  1. In 2. Out
			AN79N12, AN79N05  I. GND G. VIN O. VOUT	AN8280LF 	2SK301  Drain Source Gate
MN1280R  1---OUT 2---VSS 3---VDD	2SD973, 2SB793, 2SC2021, 2SD1055, 2SB822 	2SC1309 	UN4212 	UN4112 	
SVDS1WB40 	MA4082, MA4056, MA4091, MA4330 mark 	MA165 	SVDISR35200V 		

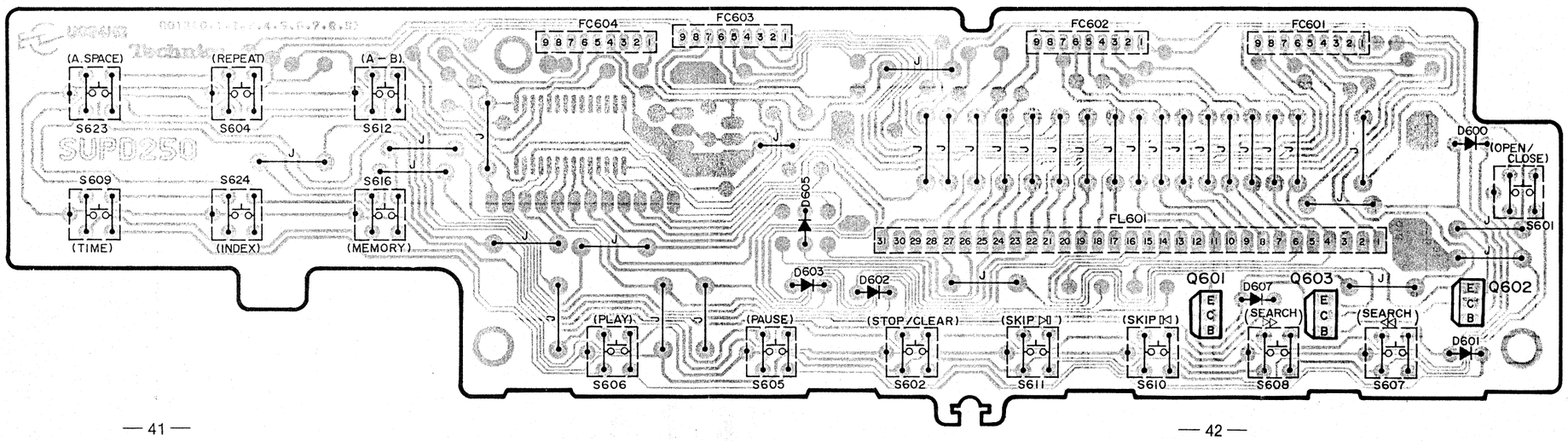
A (Optical servo P.C.B.)



B (Main P.C.B. : Regulator, system control, audio)

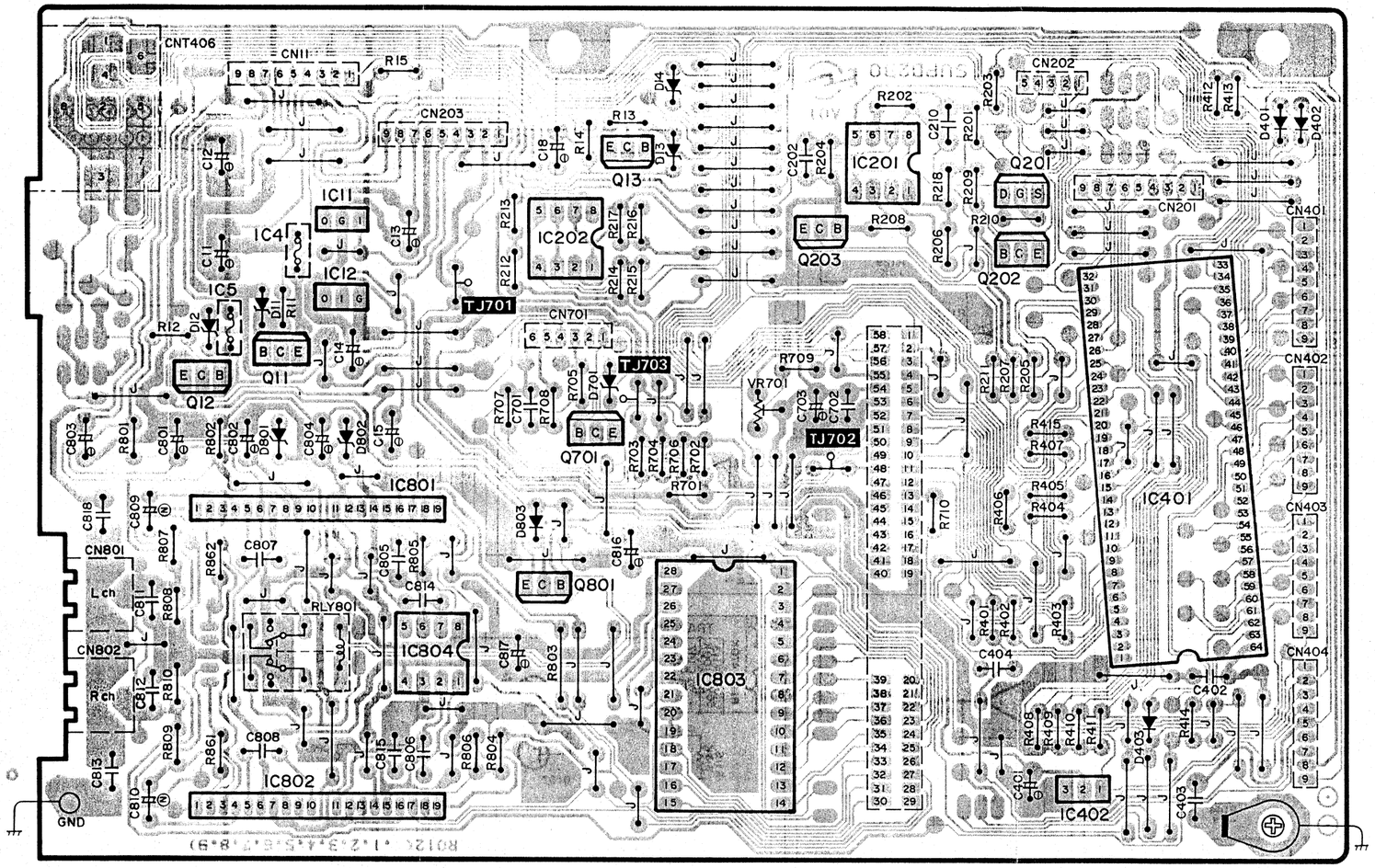


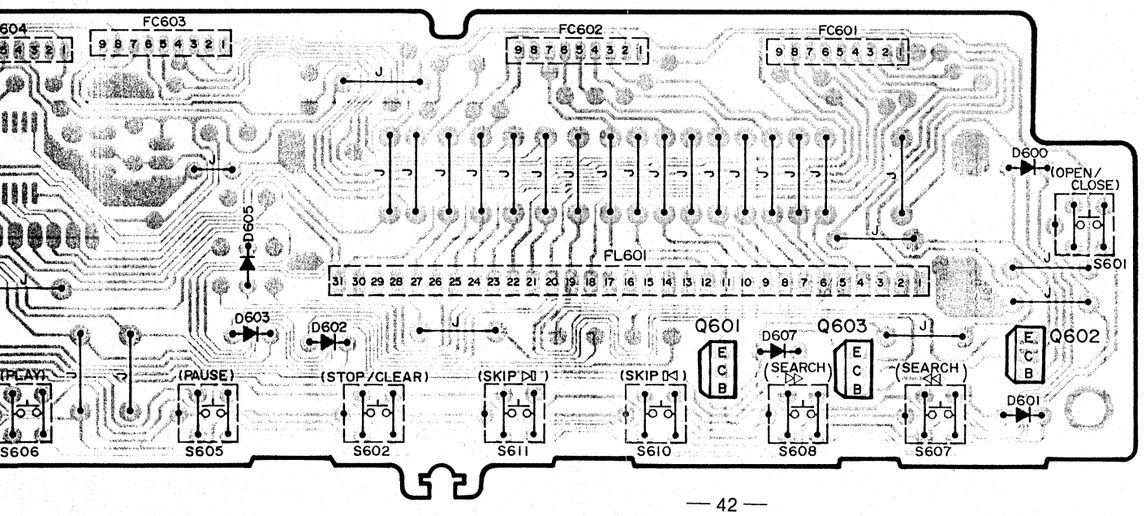
C (Key switch P.C.B.)



15 16 17 18 19 20 21 22 23 24

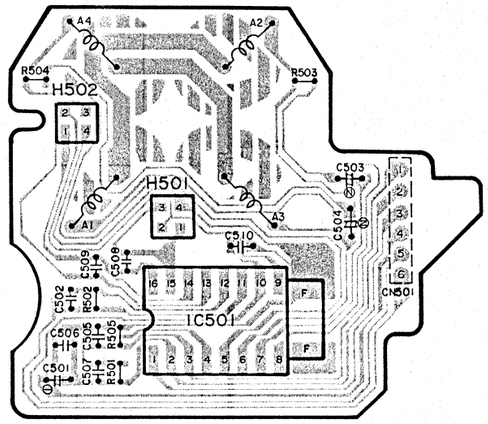
B (Main P.C.B. : Regulator, system control, audio)



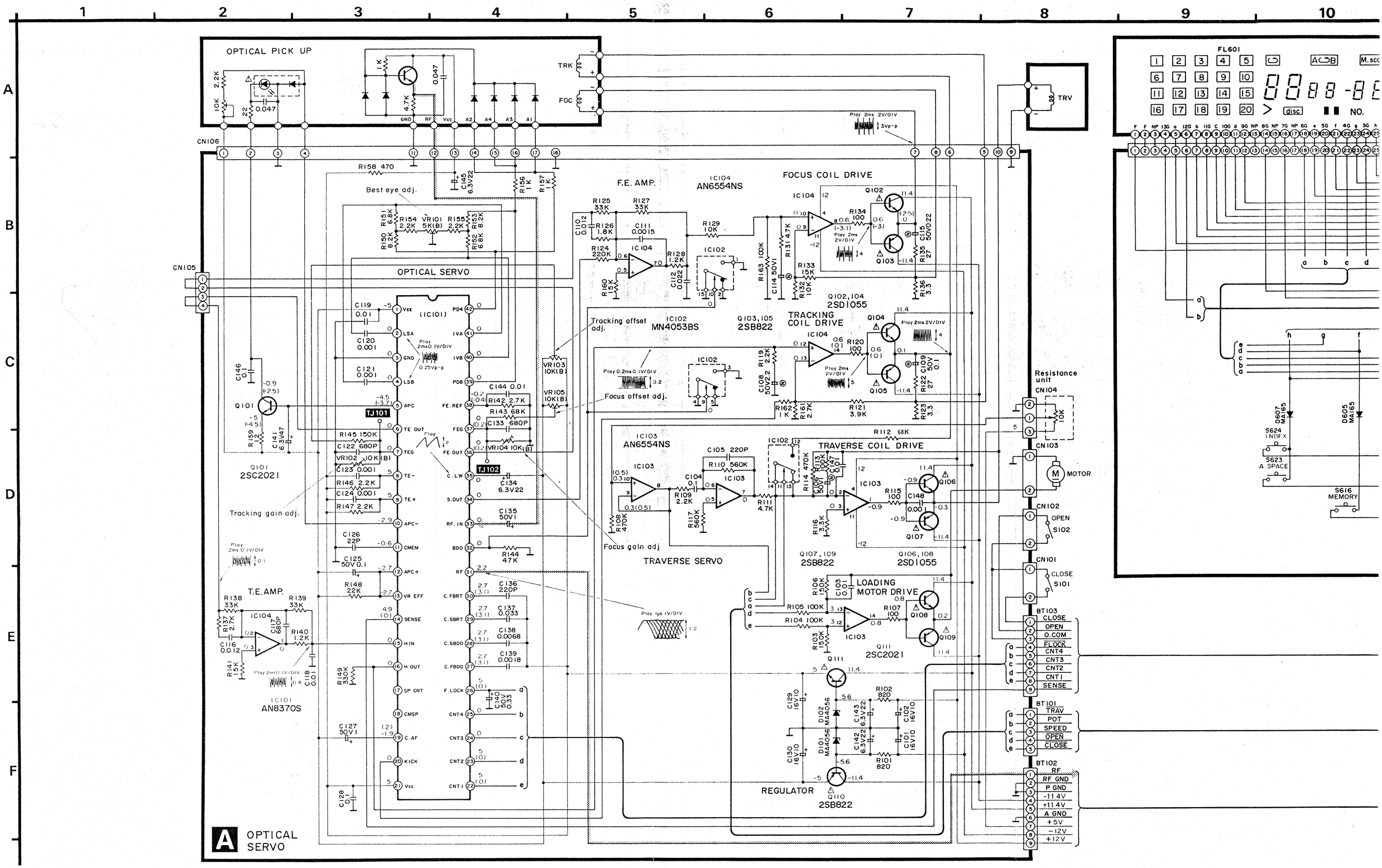


F (Spindle motor drive P.C.B.)

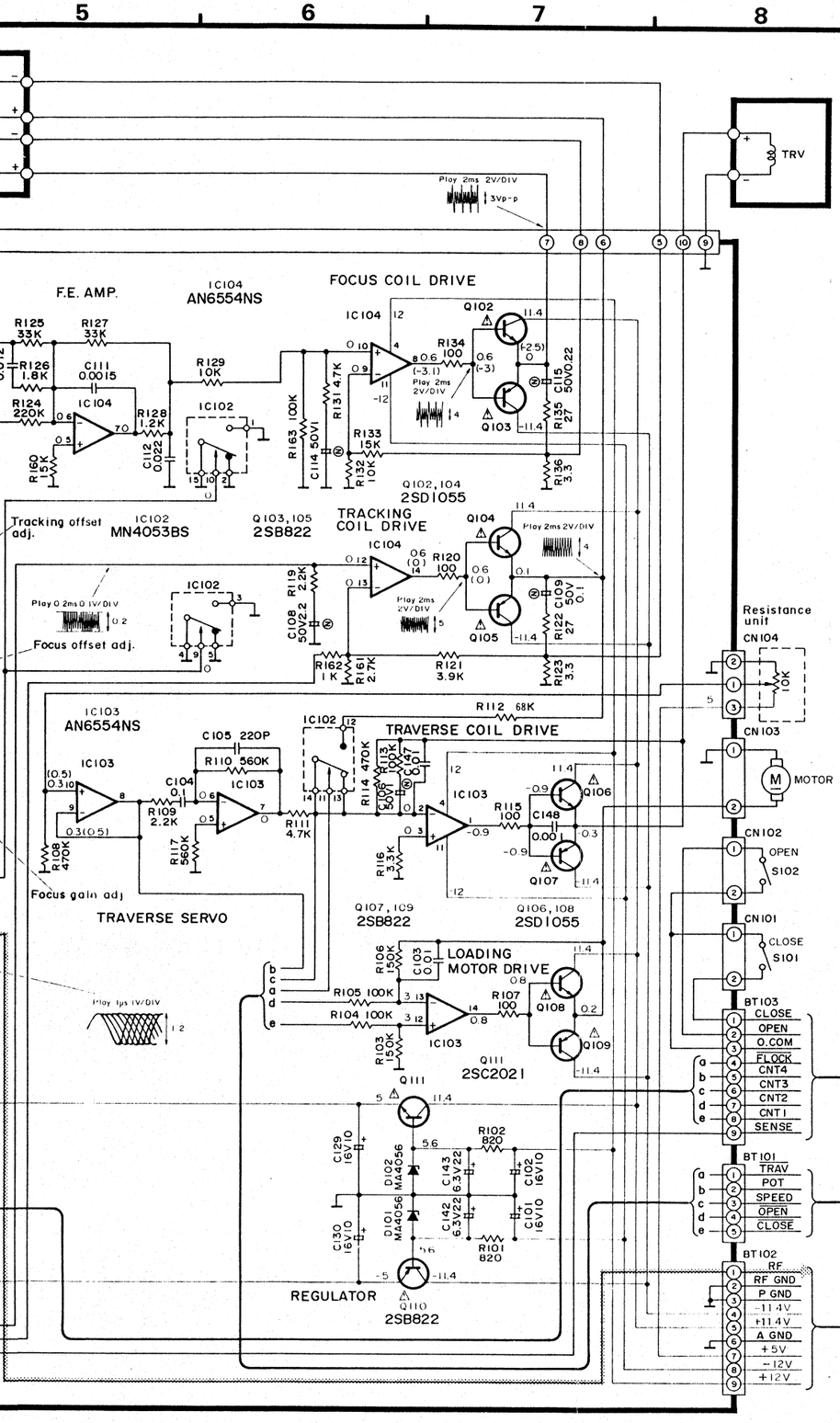
Notes: The spindle motor drive circuit board is made by iron. It is very difficult to replace the parts on the circuit board. So, the repair parts are supplied in the from of finished P.C.B.

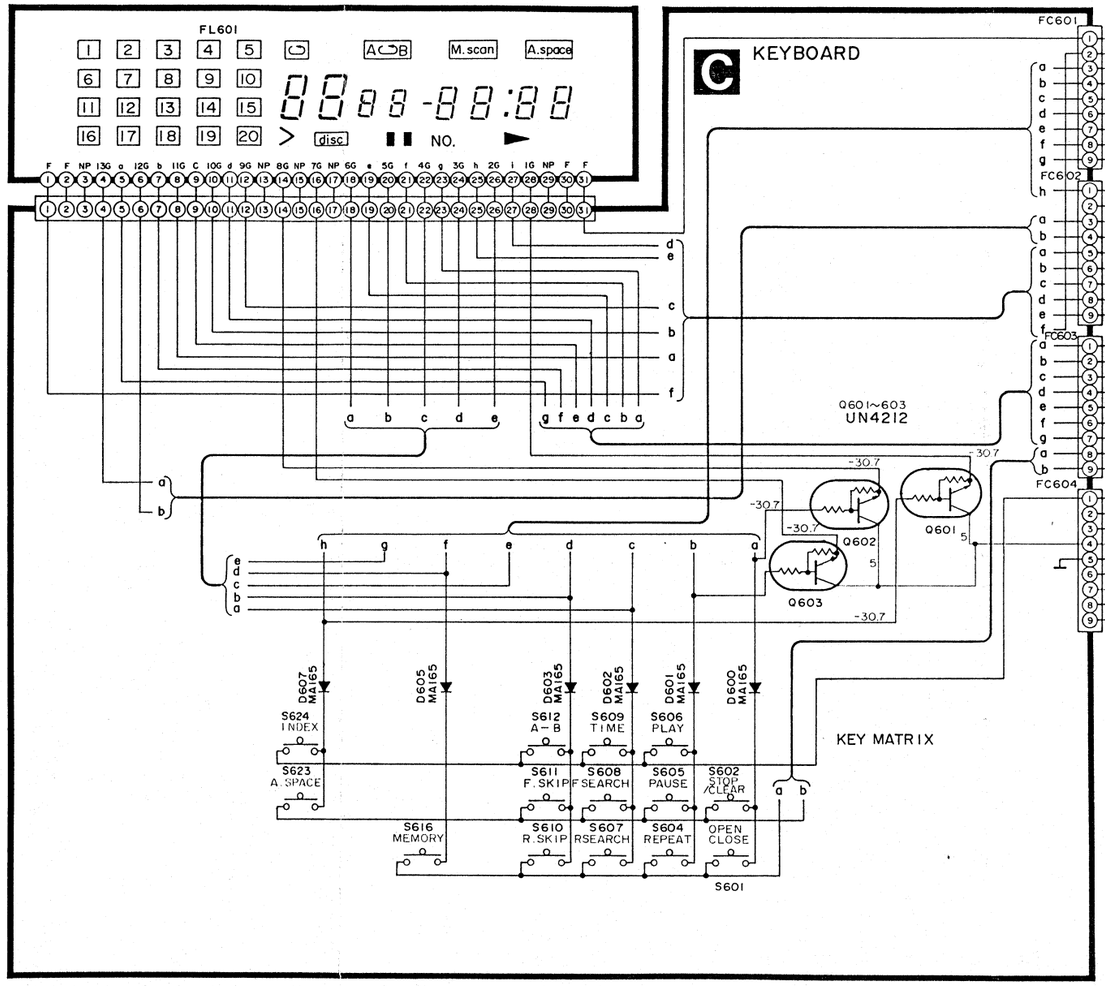


■ SCEMATIC DIAGRAM (This schematic diagram may be modified at any time with the development of new technology.)



f new technology.)





B FL DRIVE, SYSTEM CONTROL, REGULATOR & AUDIO

IC401 MN15261PDCI FLDRIVE/SYSTEM CONTROL

IC201 AN6552

IC202 AN6914

IC402 MN1280-R RESET SIGNAL GENERATION

IC803 SVIPCM54KP D/A CONVERTER

IC804 SVILM833NA

IC801 IC802 SVIAL075L AUDIO (DIGLITCH, LPF)

IC11 AN78M05 IC12 AN79N05 REGULATOR

IC4,5 SVIFU15

TRAVERSE SERVO

Q201 2SK301

Q202 UN4212

Q203 2SA1309

Q11 2SD973 Q13 2SA1309

Q12 2SB793

Q701 UN4212

Q801 UN4112

CNT406 SUBCODE

PLL adj

RF TJ701

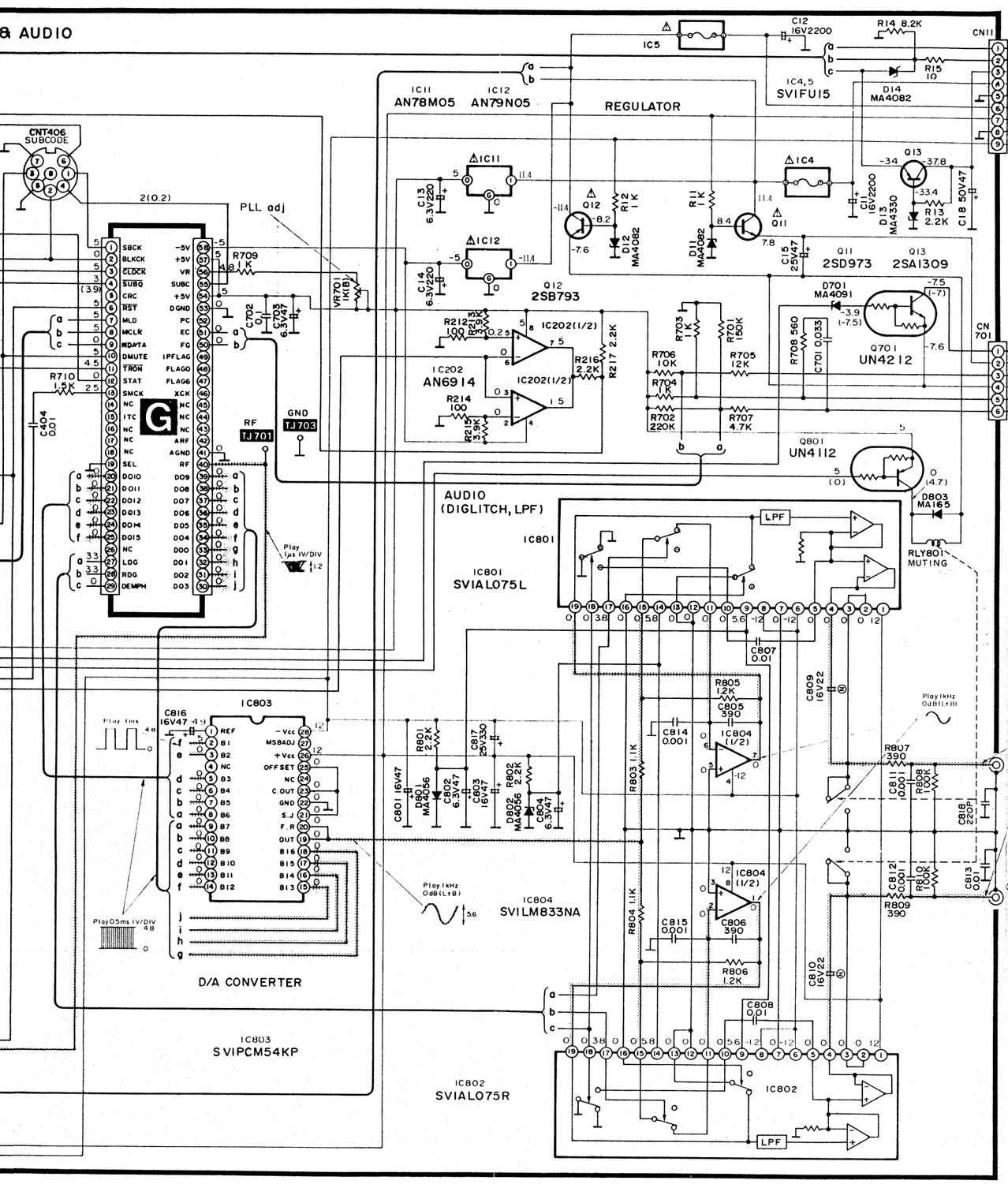
GND TJ703

RLY801 MUTING

CN801 L ch

CN802 R ch

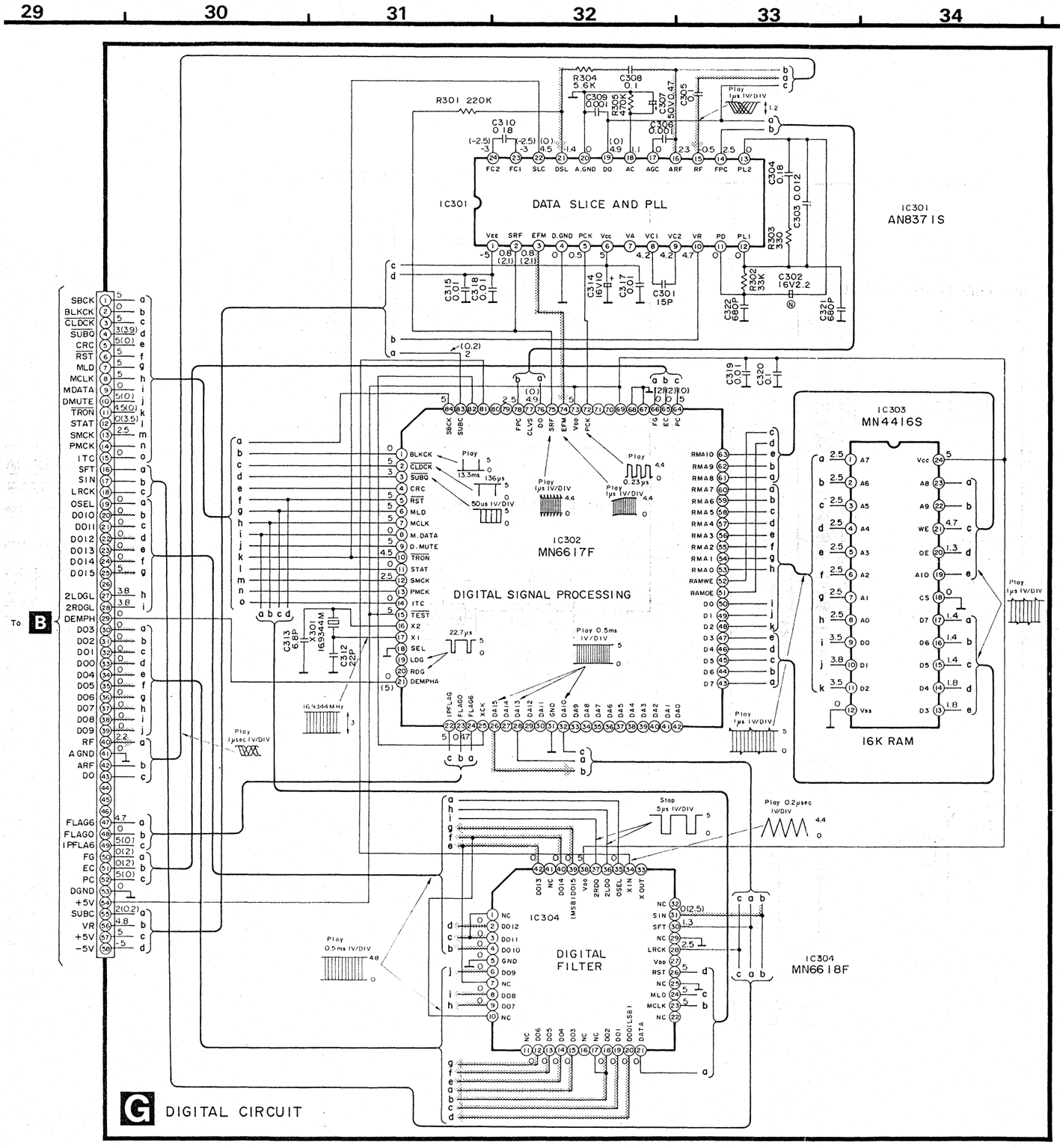
LINE OU



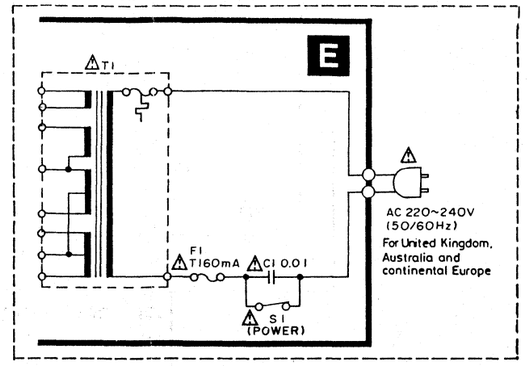
*** Caution !**

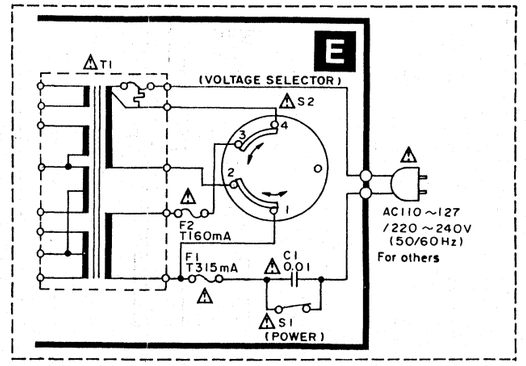
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.



• **Power supply circuit**

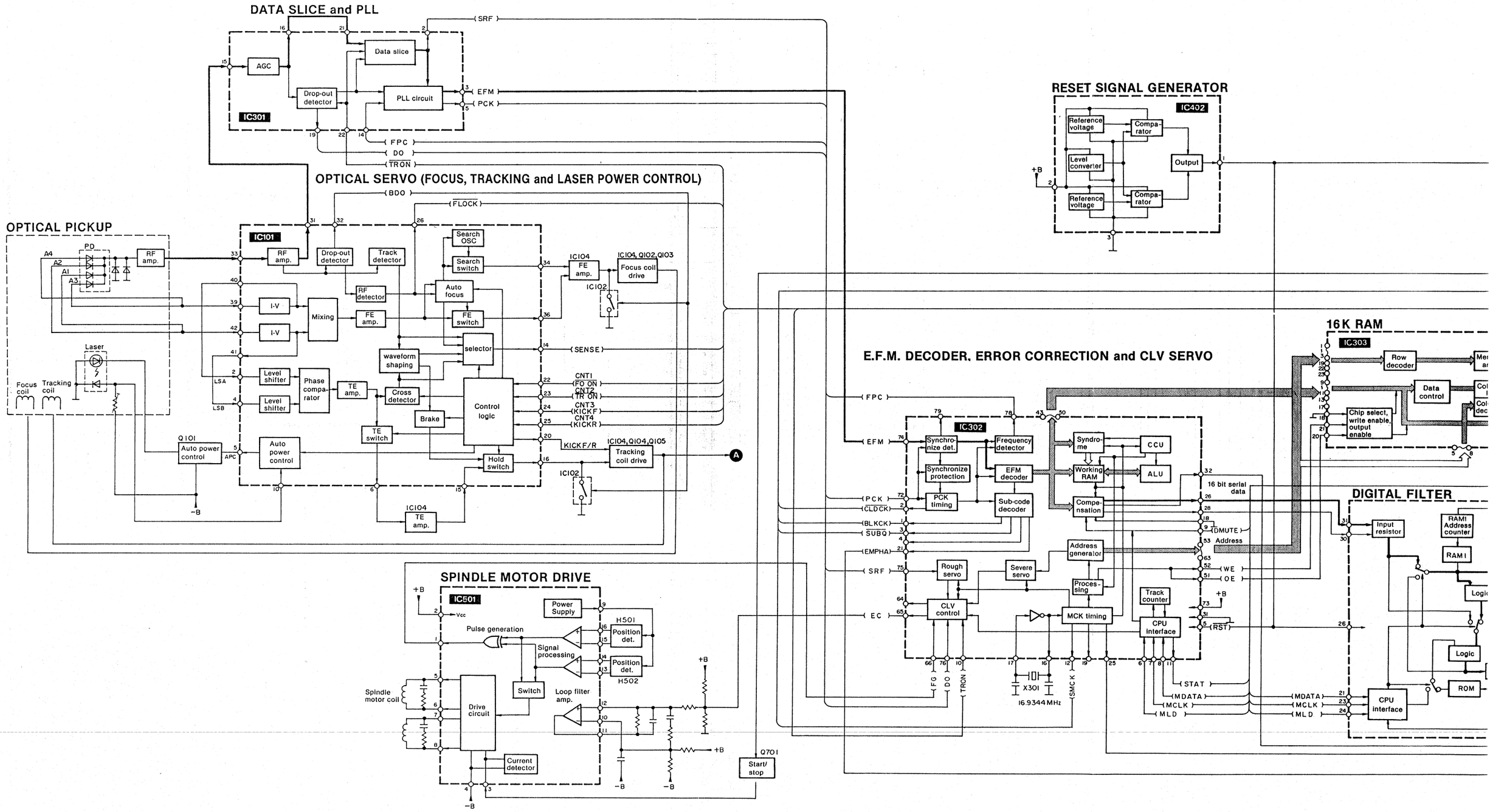




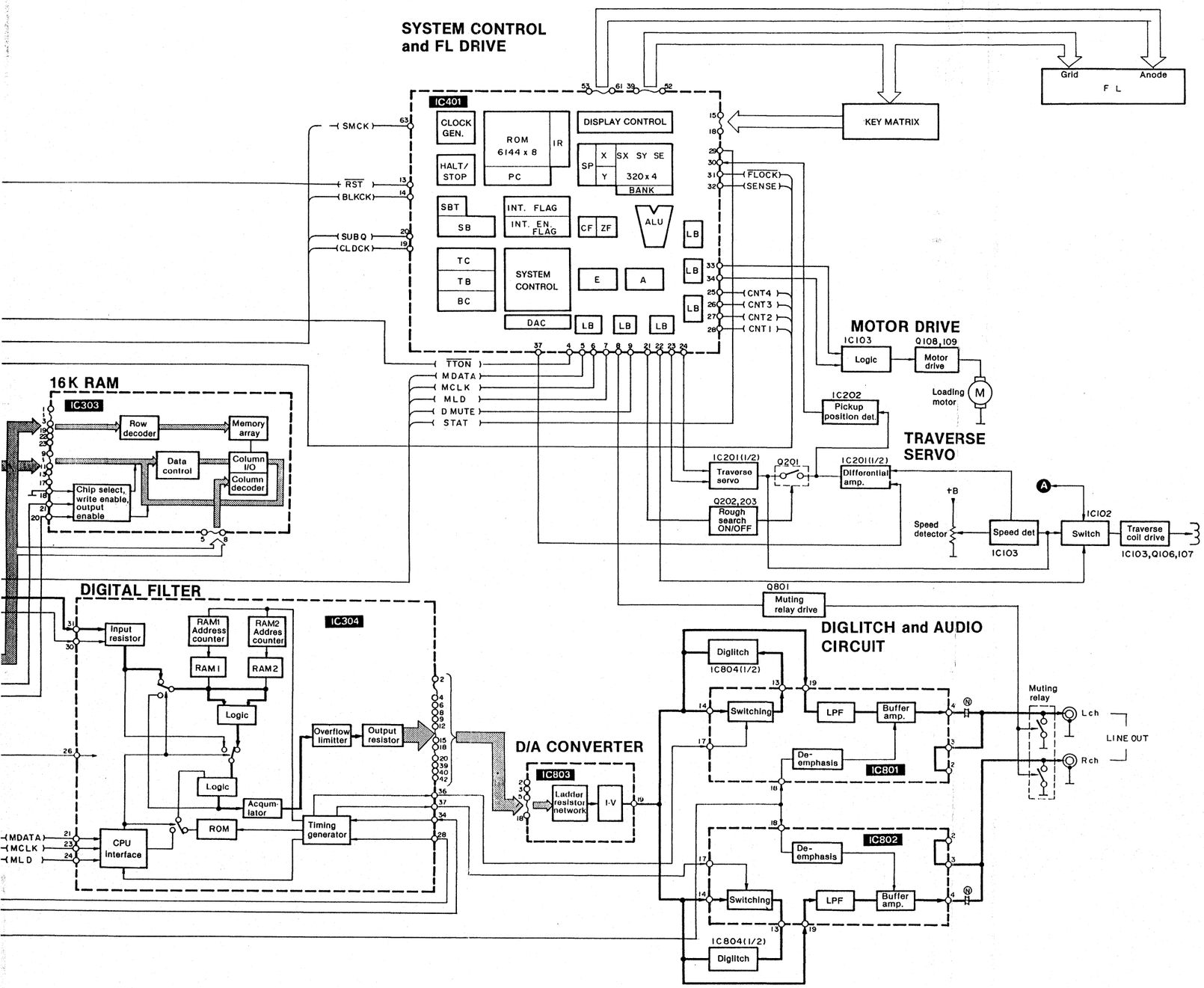
Notes:

1. **S1** : Power switch.
2. **S2** : Voltage selector switch. (For [XA], [XM], [PA], [PE] and [PC] areas.)
3. **S101** : Disc holder close detection switch.
4. **S102** : Disc holder open detection switch.
5. **S601** : Open/close switch.
6. **S602** : Stop/Clear switch.
7. **S604** : Repeat switch.
8. **S605** : Pause switch.
9. **S606** : Play switch.
10. **S607** : Backward search switch.
11. **S608** : Forward search switch.
12. **S609** : Time mode selector switch.
13. **S610** : Backward skip switch.
14. **S611** : Forward skip switch.
15. **S612** : A – B repeat switch.
16. **S616** : Memory switch.
17. **S623** : Auto space switch.
18. **S624** : Index switch.
19. The voltage value and waveform are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
    Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    * The parenthesized are the values of voltage generated during playing (Test disc 1 kHz, L + R, 0 dB), other are voltage values in stop mode.
20. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
21. ——— : Positive voltage lines and negative voltage lines.
    ▒▒▒ : Audio signal lines.

■ BLOCK DIAGRAM



SYSTEM CONTROL and FL DRIVE



16K RAM

MOTOR DRIVE

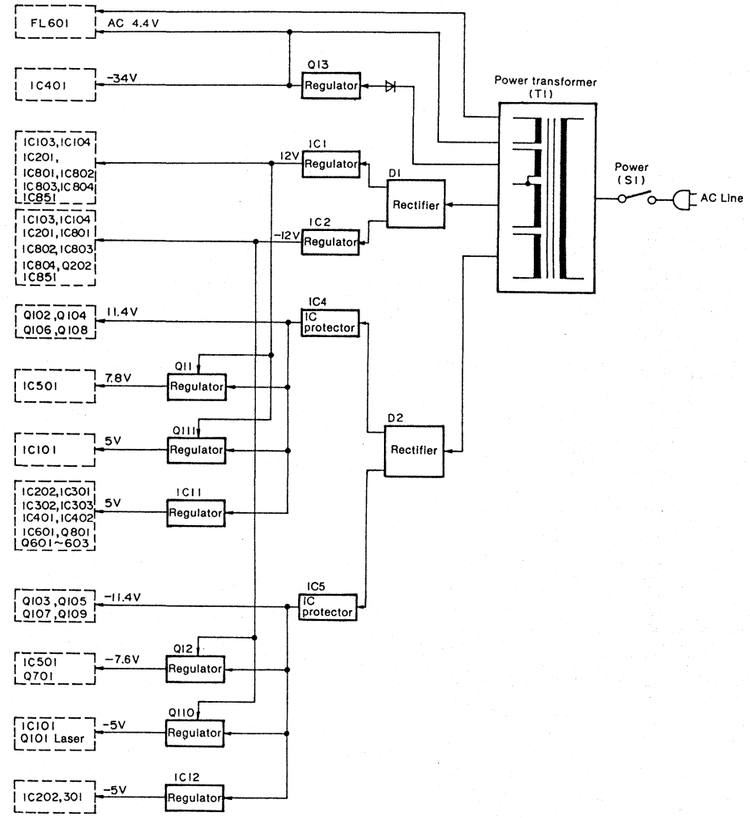
TRAVERSE SERVO

DIGITAL FILTER

D/A CONVERTER

DIGLITCH and AUDIO CIRCUIT

POWER SUPPLY



Printed in Japan
851110500 Ⓗ TK/HY

ORDER NO. HAD8511289C0-A

■ MESSUNGEN UND JUSTIERUNGEN Deutsch

- Die Justierung dieses Gerätes is grundsätzlich gleich wie für Modell SL-PJ11. (Die Justierpunkte sind teilweise verschieden.)
  Für nähere Einzelheiten dazu, siehe Service-Handbuch für Modell SL-PJ11 (Bestell-Nr. HAD 8509261GO).
- Es ist gefährlich, in den Laserstrahl zu sehen oder ihn zu berühren. (Laser-Strahlung ist unsichtbar.)
  Bei eingeschaltetem Gerät strahlt das Abtastsystem Laserstrahlung aus. Bei der Justierung ist dieser Punkt besonders zu beachten.

ELEKTRISCHE JUSTIERUNG

PROVISORISCHE EINSTELLUNG JEDES DREHWIDERSTANDES

1. Die Gummikappe abnehmen.
2. Jeden Drehwiderstand der Servo-Platine wie gezeigt provisorisch einstellen.

FOKUS-VERSTÄRKUNGS-JUSTIERUNG

1. Den Niederfrequenz-Oszillator auf eine Frequenz von 750 Hz und eine Ausgangsspannung von 150 mVss einstellen und ihn an OSC und GND des Servo-Verstärkungs-Justierers anschließen.
2. CH1 und CH2 des Oszilloskops an TP1 und TP2 des Servo-Verstärkungs-Justierers anschließen. (TP3 an Masse)
   Einstellungen am Oszilloskop:
   VOLT ..... 100 mV (beide Kanäle)
   KIPP ..... 2 msec.
   EINGANG ..... Wechselstrom
3. Die Stromversorgung des Geräts einschalten.
4. Mit dem Schalter open/close den Testdisk (SZZP1014F) einlegen und auf Wiedergabe schalten.
5. Den Schaltknopf des Servo-Verstärkungsreglers (SZZP1017F) auf "2" → "3" und den on/off-Schalter auf "ON" stellen.
6. Wenn das Gerät auf Wiedergabe läuft und das 750Hz-Signal auf dem Oszilloskop angezeigt wird, VR 104 so einstellen, daß die Kurven und Amplitüden der beiden Kanäle wie in der Abbildung gezeigt gleich sind.
7. Die Stromversorgung des Geräts abschalten.

SPURLAGE-VERSTÄRKUNGS-JUSTIERUNG

1. Das Niederfrequenz-Oszilloskop auf eine Frequenz von 1,2 kHz und Ausgangsspannung von 150 mVss einstellen.
2. Die Oszilloskop-Anschlüsse wie oben vornehmen und die Einstellungen am Oszilloskop wie wie folgt vornehmen.
   Einstellungen am Oszilloskop:
   VOLT ..... 100 mV (beide Kanäle)
   KIPP ..... 0,5 msec.
   EINGANG ..... Gleichstrom
3. Die Stromversorgung des Geräts einschalten.
4. Mit dem open/close-Schalter den Testdisk (SZZP1014F) einlegen und das Gerät auf Wiedergabe stellen.
5. Den Schaltknopf des Servo-Verstärkungsreglers (SZZP1017F) auf "2" → "1" und den on/off-Schalter auf "ON" stellen.
6. Wenn das Gerät auf Wiedergabe steht und auf dem Oszilloskop das 1,2kHz-Signal dargestellt wird, muß VR 102 so eingestellt werden, daß die Kurven und Amplitüden auf beiden Kanälen wie in Abbildung gezeigt gleich sind.
7. Die Stromzufuhr zum Gerät abschalten.
8. Der Servo-Verstärkungs-Justierer wird für die weiteren Justierungen nicht gebraucht. Daher das Regelgerät entfernen und den Kurzschlußstecker von CN105 wieder in seiner ursprünglichen Position einsetzen.

BESTE AUGEN-(PD-BALANCE)-JUSTIERUNG

1. CH1 des Oszilloskopes an TJ701 (+) und TJ703 (-) der Hauptplatine anschließen.
   Einstellungen am Oszilloskop: VOLT ..... 200 mV
   KIPP ..... 0,5 µsec.
   EINGANG ..... Wechselstrom
2. Die Stromzufuhr einschalten und Band 13 (0,5 mm schwarzer Punkt) auf der Testplatte abspielen.
3. VR101 so justieren, daß das Augenmuster des HF-Signals am weitesten offen ist.

FOKUS-OFFSET-JUSTIERUNG

1. CH1 des Oszilloskops an TJ701 (+) und TJ703 (-) an die Hauptplatine anschließen.
   CH2 an TJ102 der Servo-Platine anschließen.
   Einstellungen am Oszilloskop: VOLT ..... 500 mV (CH1)
   100 mV (CH2)
   KIPP ..... 0,5 µsec.
   EINGANG ..... Wechselstrom (CH1)
   Gleichstrom (CH2)
   BETRIEBSART .. NORM (Schaltgriff auf CH1)
2. Band 13 (0,5mm großer schwarzer Punkt) auf der Testplatte abspielen.
3. So triggern, daß eine Wellenform wie gezeigt auf dem Oszilloskop erscheint, und VR 105 so justieren, daß die HF-Senkung von CH1 und die Wellenform-Amplitude von CH2 minimal werden.

SPURLAGE-OFFSET-JUSTIERUNG

1. CH1 des Oszilloskops ar TJ701 (+) und TJ703 (-) an die Hauptplatine anschließen.
   CH2 an TJ101 der Servo-Platine anschließen.
   Einstellungen am Oszilloskop: VOLT ..... 500 mV (CH1)
   100 mV (CH2)
   KIPP ..... 0,5 µsec.
   EINGANG ..... Wechselstrom (CH1)
   Gleichstrom (CH2)
   BETRIEBSART .. NORM (Schaltgriff auf CH1)
2. Band 13 (0,5mm großer schwarzer Punkt) auf der Testplatte abspielen.
3. So triggern, daß eine Wellenform wie gezeigt auf dem Oszilloskop erscheint, und VR 103 so justieren, daß die HF-Senkung von CH1 und die Wellenform-Amplitude von CH2 minimal werden.

PLL-JUSTIERUNG

1. CH1 des Oszilloskops an R809 (+) und Chassis (-) der Hauptplatine anschließen.
   Einstellungen am Oszilloskop: VOLT ..... 1 V
   KIPP ..... 1 msec
   EINGANG ....., Gleichstrom
2. Band 13 (0,5mm großer schwarzer Punkt) auf der Testplatte abspielen.
3. VR701 unter Beobachtung des Oszilloskops justieren und in die Mitte des Bereichs einstellen, wo die Wellenform stabil ist.

PRÜFUNG DES WIEDERGABEBETRIEBS NACH DER JUSTIERUNG

- Prüfung des Überspring-Suchlaufs

1. Eine gewöhnliche Platte abspielen.
2. Die Skip-Taste drücken, um den Überspring-Suchlauf zu prüfen. (Im Vorwärts- und Rückwärts-Betrieb prüfen.)

- Prüfung des manuellen Suchlaufs

1. Eine gewöhnliche Platte abspielen.
2. Die Taste für manuellen Suchlauf drücken und prüfen, ob glatter Suchlauf mit niedriger und hoher Geschwindigkeit möglich ist. (Im Vorwärts- und Rückwärts-Betrieb prüfen.

- Prüfen auf Defekte

1. Programm 13 der Testplatte abspielen und überprüfen, daß kein Tonausfall oder Rauschen auftritt. (Schwarzer Punkt)
2. Programm 14 der Testplatte abspielen und überprüfen, daß kein Tonausfall oder Rauschen auftritt. (Fingerabdruck)

JUSTIERUNG DES OPTISCHEN ABTASTSYSTEMS

PROVISORISCHE EINSTELLUNG JEDES DREHWIDERSTANDES

1. Die Gummikappe abnehmen.
2. Jeden Drehwiderstand der Servo-Platine wie gezeigt provisorisch einstellen.

JUSTIERUNG DER PLATTENTELLERHÖHE

1. Das Oszilloskop an TJ101 (+) und Chassis (-) der Servo-Platine anschließen.
   Einstellungen am Oszilloskop:
   VOLT ..... 100 mV
   KIPP ..... 5 msec.
   EINGANG ..... Gleichstrom
2. Den Netzschalter einschalten und die Testplatte auflegen.
3. Die Gleichstrom-Nullbalance des Oszilloskops einstellen.
4. Die Testplatte abspielen.
5. Die Ladeeinheit während des Abspielens von Hand aufhalten.
   Vorsicht: Die Einheit horizontal und frei von Vibration halten.
6. Die Justierschraube so drehen, daß die Spannung in der Wellenformmitte des Oszilloskops OV beträgt.
   Vorsicht: Die Justierschraube nicht übermäßig drehen.
7. Nach erfolgter Justierung ist die Justierschraube mit Lack zu sichern.

MECHANISCHE JUSTIERUNG

1. Das Oszilloskop an TJ701 (+) und TJ703 (-) der Hauptplatine anschließen.
   Einstellungen am Oszilloskop:
   VOLT ..... 0,5 V
   KIPP ..... 0,5 µsec.
   EINGANG ..... Wechselstrom.
2. Den Netzschalter einschalten und die Testplatte auflegen.
3. Die Testplatte abspielen.
4. Das Gerät wie gezeigt aufstellen und die Ladeeinheit frei von Vibration halten.
5. Die Steckverbindungen (CN101 - 103) der Servo-Platine herausziehen.
6. Abwechselnd die beiden Justierschrauben des optischen Abtastsystems mit Sechskant-Schraubschlüssel (SZZP1044C) drehen, so daß das Augenmuster der Wellenform (HF-Signal am Oszilloskop am weitesten offen wird.

   Vorsicht:

1. Darauf achten, daß die flexible Platine des optischen Abtastsystems bei der Justierung nicht beschädigt wird.
2. Vor dem Installieren der Servo-Platine ist darauf zu achten, daß der Kondensator auf der Platine herabgelegt ist.

ELEKTRISCHE JUSTIERUNG

1. Die Ladeeinheit ins Chassis einpassen.
2. So vorgehen, wie im Abschnitt "Elektrische Justierung" vorstehend beschrieben.